AMERICAN GAS ASSOCIATION MONTHLY

Vol. III No. 12

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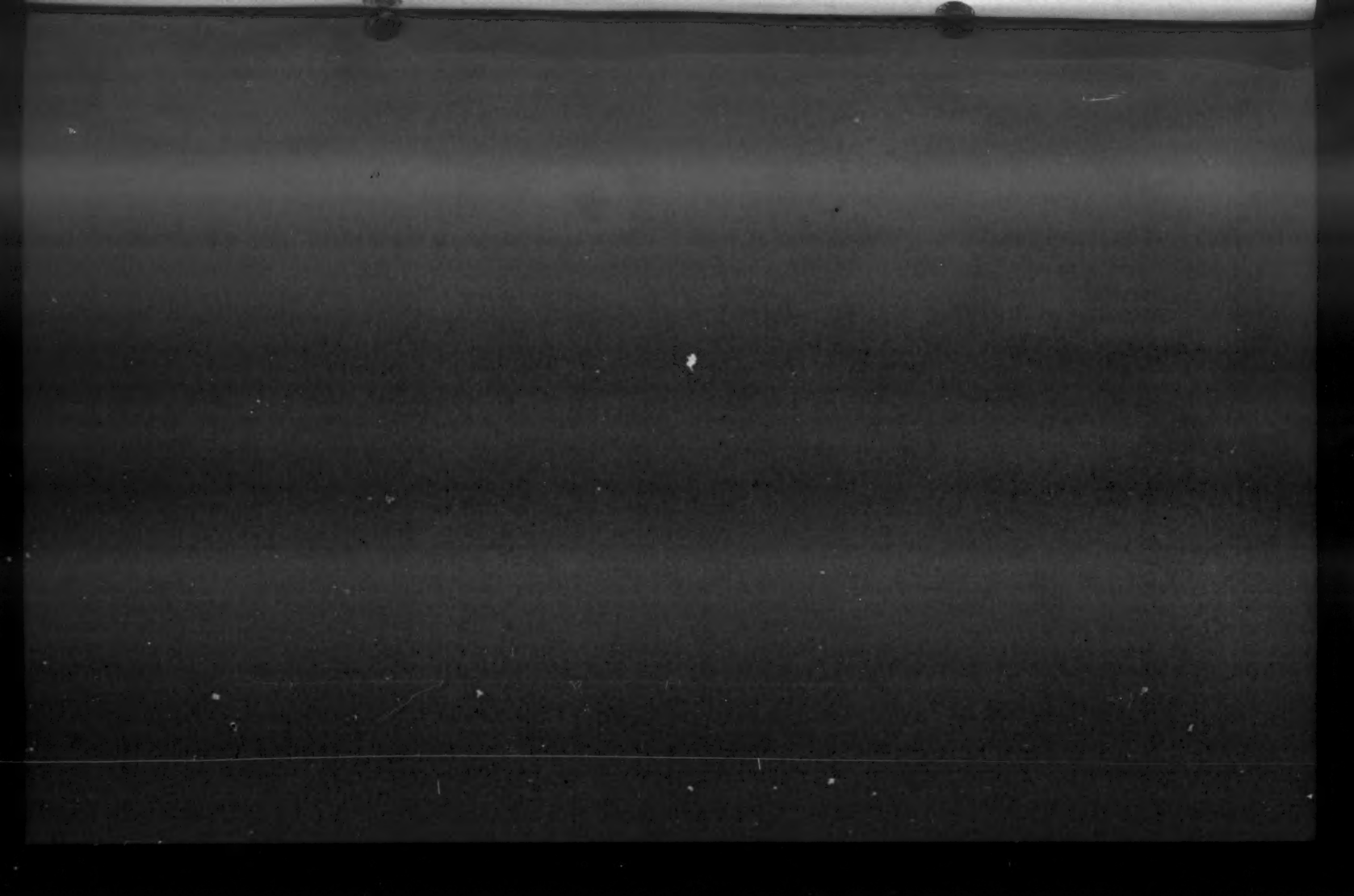
LET us give our thoughts to determining the things that are essential, our time to planning their accomplishment, and let us persevere until their completion is a fact.

DANA D. BARNUM.



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The Danger of Smog

In a New York *Times* Book Review Mr. Thomas Quinn Beesley writes of "The Eugenic Prospect" by Doctor Saleeby of Edinburgh. We have not read the book but we have read the review and there are portions of the former quoted which are most interesting to the gas man. Dr. Saleeby writes of the health prospects of posterity in which he sees little light for his own Londoners and Edinburghers until those cities learn to do away with their smoke.

"Smoggy London" he calls it with its fogs heavy with coal dust and in the comparison of which New York is a shining metropolis. If one may not find much encouragement in his eugenic prospects for coming Londoners one at least may find healthy possibilities for the gas industry's future. Read it from his own pen:—

> "According to the chemist, gas and coke, the combustible residues of coal after its still more precious constituents have been removed, are what we should use as fuel.
>
> According to the physiologists, headed by Professor Leonard Hill, we should heat our houses by the radiant heat, smokeless, but involving ventilation, which the gas fire alone affords.
>
> According to every one who has ever tried to cook anything, the gas cooker is civilization, and the kitchen range savagery.
>
> The kitchen range, provided for the combustion of soft coal, and the continuance of the "hellish and dismal cloud" which makes our cities so infernal in the Winter, should henceforth be relegated to the museums which exhibit other horrors of the Dark Ages.
>
> Probably no woman will consent, even if any woman be allowed, to use such an antiquated abomination ten years hence. Does the Ministry of Health, in defiance of the most obvious and elementary laws and needs of health, propose to allow local housing authorities to minister to disease, and to build houses which—like our battleships, according to Lord Fisher—will last a hundred years, and be obsolete in five?"

AMERICAN
GAS ASSOCIATION
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Mr. Munroe Reviews the Year

Address of Charles A. Munroe, President of the American Gas Association, at the Third National Convention and Exhibition of the Association, Congress and Auditorium Hotels, Chicago, November 9, 1921.

THE American Gas Association held its organization meeting in the city of New York in June, 1918. It was organized to promote and develop the gas industry and to co-ordinate activities to the end that it might serve to the fullest possible extent the best interests of the public. At the time of its organization the world had been at war for four years. Each of these years, as one succeeded another, brought problems more difficult than its predecessor, finally culminating in 1920, the darkest year the industry has ever seen.

But the great distress of our industry was the blending force which brought all of its elements together, and now as we emerge into a world of peace we see that the terrible strain of those days has accomplished one great thing—it humbled every man in this business. Every one became desirous of co-operating with every one else, in order to remedy conditions which were threatening the very life of the business. During this period our Association was fortunate in having as its President a gentleman of great distinction, who endeared himself to all those who worked with him, and who eliminated any possibility of jealousy among the member companies. For how could such unworthy feelings exist in the face of such unselfishness and high purpose as he showed on every occasion. I refer to the Honorable George B. Cortelyou.

Gas Men Agree on Fundamentals

It is indeed gratifying, as was brought out at the Atlantic City conference, that we have come to a unanimity of opinion on the general character of rate structures. This has been a subject of earnest discussion among gas men for many years, and to-day I think I can safely say that there is not a single fundamental policy of our business on which there is disagreement.

Taxation Problems

This Association was among the first in the country to appreciate the harmful effect which flows from tax-exempt securities, estimated to amount to as much as ten billion dollars. It was the hope of your Association that it would be possible to point out to the country and to Congress that the securities of public utility companies in the hands of holders should in all fairness be on a parity for the purposes of taxation with the securities issued under state authority. We have made substantial progress in arousing a public sentiment throughout the length and breadth of the land against tax free securities, and it is our earnest hope that the time may soon come when all securities will be on a parity for the purpose of taxation.

Your Association is co-operating with the National Electric Light Association and the American Electric Railway Association, and as a result of this co-operation a committee on federal taxation, representing the public utility interests of the country, has been created. That committee has been active in presenting the views of your Association to the Ways and Means Committee of the House and the Finance Committee of the Senate. This Committee is also urging the adoption of Senator Smoot's bill providing a sales tax, and is also keeping close watch upon the development of the 1921 Revenue Law, with the hope of eliminating from this law, provisions which would be harmful to our industry.

Effectual protest against the inclusion in the Fordnay tariff bill of a tax on Mexican oil was made by the Gas Oil Committee of the Association. It is believed that this government could not with propriety levy an import tax on oil and at the same time protest against an export tax levied by the Mexican Government.

Calorific Standards Should be Modified

Throughout the year the Association has had occasion to assist in the elimination of candle-power standards from the requirements of city ordinances and State Commissions. It is to be hoped that the withdrawal of the obsolete candle-power standard will be shortly followed by a modification downward of the high calorific standards which now prevail. It can be demonstrated that a gas with a calorific standard of 300 B. t.u. is capable of doing all the work which can be done with a gas of a higher calorific value, and in the main such a gas can be used with greater efficiency, due to the smaller quantity of air required to complete combustion. It would seem self-evident that there should be no calorific value required higher than can be produced from the most economical fuels and under the most modern processes of manufacture. With the increasing demand for oil, the importance of lower calorific values is emphasized. As a conservative measure to preserve the oil resources of the nation, there should be a general lowering of the B. t. u. standard.

In order that this Association might be thoroughly posted on the workings of a decreased calorific standard, especially in England, we dispatched our engineer, Mr. Phillips, to study the situation there and to report. There will be available to the membership of this Association the results of his study.

The Gas Company Telling Its Story

When the period of losing money came, relief in the way of increased rates had to be secured if the utilities were to survive. In the past year your Association has been active in telling the public the story of the gas company through its literature and through its assistance in organizing committees on public utility information in the various states. We have tried to make the public realize that their great public utility institutions were in danger of destruction, owing to increased costs of delivering the service, unless compensatory increases in rates were granted, and further that the comfort and prosperity of each community is inseparably linked with the welfare of these utilities. We believe that the people understand to-day, as they never understood before, the fundamental economics underlying our business.

As evidence of the better understanding by the public of our business and the fairness of treatment which follows this understanding, a notable instance may be mentioned. The Chicago Association of Commerce, representing the business men of this community, appeared before the Public Utilities Commission of the State and urged that the Commission increase the rate of the railway companies, the telephone company and the gas company. This action of the Association of Commerce was based upon the conviction that the public begins to lose, or actually loses, the conveniences they should have when they exact rates for service which are below the operating cost, including a fair return on the investment, and furthermore that it does not necessarily follow that taking away something from a public utility is for the public good.

We must continue the work until the public realizes that a public utility property is devoted to the service of the whole public and that their interests are thoroughly safeguarded when the operation of a utility is regulated by competent men chosen by their elected representatives. Public utility service is no longer a luxury to be enjoyed by the wealthy, but rather is a necessity for the comfort and convenience of all the people, and therefore, if all the people must have this service, it is self-evident that the people must pay sufficient for the service to enable the utilities to carry on.

Fair Gas Rates Must Be Continued

At the present time a difficult task confronts us—one which we can only meet through education of the public. Prices for all commodities have had a decided drop, and it is only natural that the people, through their representatives, should inquire when the price of our gas is to be reduced. We must point out to our consumers that a considerable period elapsed between the time that commodity prices began to rise in value and the time that we received relief through increased rates. Some of the delay in receiving increased rates is chargeable to the management of the companies, many of whom hesitated to ask for the increase in rates in the hope that the increased commodity cost was temporary and would soon return to normal. Again

there was a long delay between the application for the increase and the order putting it into effect—with the result that during this delay inventories and working capital were used up, and maintenance work deferred. When the public understand that during the past years you have been unable to earn sufficient to pay your operating expenses and taxes and a reasonable return on the value of your property devoted to the public use, they are going to permit you, in all fairness, to make up, through your rate, any deficits thus incurred.

Selling Securities to Customers

Article Two of the constitution of our Association deals with the purposes for which it was formed. Section 4 reads as follows: "To conserve and encourage investment in the gas industry."

We know that our industry stands at the threshold of an era of great prosperity and useful service. Therefore, each company should have no hesitancy in under-taking to sell its junior securities to its customers. The money obtainable in this way is as cheap as it can be secured from any source, and besides we should do our share toward the education of the public in the fundamentals of the public utility business. This education can be accomplished in no more thorough and effective manner than through the sale to our customers of our securities.

Technical Training Should be Encouraged

This Association must continue the work of pointing out to the universities and technical schools of the country the demand which exists for men fully prepared to enter the gas business. During the year University of Michigan has adopted and now is offering a full three-year course in gas engineering, and if our industry is to go forward, and achieve the most which the business is capable of doing, it must have pouring into it every year a large number of technically trained, fully prepared gas engineers.

Employees' Representation

In the coming year we should give attention to the question of Employee's Representation, and those companies which have not looked into the benefits to be derived from the adoption of such a plan can well afford to do so. The individual to-day is entitled to receive fair treatment from his superior, and such plans of Employees' Representation afford an orderly method for the disposition of any grievances to the mutual advantage of the individual and the company.

The Exhibit

We are particularly indebted to the Manufacturers' Section for the splendid exhibit which it has provided at this Convention, and it should be the duty of every one of our members to acquaint themselves with the appliances offered.

Geographical Consideration as Affecting Membership

Notwithstanding the very gratifying membership growth which this Association has enjoyed in the past year, there are a number of companies remotely situated, notably on the Pacific Coast, which are not members of the Association and which, because of their location and consequent inability to have their employees participate in the work of the Association, feel that they should have the benefits of a membership, but should not pay as much in the way of

dues as do those companies whose representatives are more active in the work. They should be members for our common good, and it should be possible to find some equitable adjustment of dues so that they will become members.

Proposed Amalgamation with Natural Gas Association

A great sister association is devoting time and energy in the duplication of much of the work which is being performed by this Association. I refer to the Natural Gas Association of America. As it becomes necessary to amplify the natural gas supply with artificial gas, the work of duplication will become more apparent, and would therefore seem proper that there should be an amalgamation of these two associations, in order that there be one association **100 per cent** representative of the gas industry.

Judging the Future by the Past

Let us now, for a moment, take a backward look, for we may be able to judge the future by the past. After having enjoyed an era of great prosperity for more than twenty-five years, the gas industry generally throughout the country, after the Civil War, encountered difficulties similar to those which have confronted our industry for the last seven years. On March, 1, 1867, the Board of Directors of the Memphis Gas Light Company published in pamphlet form, for distribution, the company's reply to the complaint of the city that the rates charged for gas were exorbitant. I quote from that pamphlet as follows:

"It is worthy of mention that out of near six hundred gas companies in the United States less than one hundred and fifty are paying 6 per cent on their value or cost of construction, and many are being operated at an absolute loss, as a matter of convenience to their stockholders, who are consumers.

"As to the price charged in this city, there has been so much misrepresentation that we beg to make comparison with some other places. It has become a stereotyped expression, with some classes, that 'the people of Memphis are charged more for gas than the people of any other city on the continent.' The net price charged by this company is $5.50 per 1,000 cubic feet, with no meter rent. The price in St. Louis is $4.50; in Nashville $4.50; in Mobile $5.00; Atlanta, $5.50; Savannah $6.00; Norfolk $6.00; Natchez $6.00; Vicksburg $6.00; New Orleans $4.00 (are restricted to this price by their charter or would charge $6.00); Charleston $7.00 (but contemplate a reduction to $4.00 in gold); Montgomery $8.00; Macon $8.00; Galveston $8.00; San Francisco $6.00 in coin; and Sacramento $9.00 in gold (payable weekly on presentation of the bill).

"In a majority of cities where gas is sold at $5.00 or less meter rents, etc., are collected, quite sufficient to swell the receipts to about an average of 50 cents per 1,000 cubic feet over the rate charged on the item of gas. With reference to the price charged elsewhere, the price here is lower than that of nearly any other article of common use, as compared with prices before the war, say in 1860. For instance, the price of gas was then $3.50 per 1,000 cubic feet, and is now sold at $5.50; rate of increase, $57^1/_7$ per cent. Coal was then sold at 50 cents per barrel; is now sold at $1.15, and until very lately at $1.50; rate of increase, 120 per cent, and until very lately, 200 per cent. Flour and sugar

have each increased 200 per cent; bacon, beef, fresh meats, butter, eggs, poultry, and fruits have all increased in price 100 per cent. Boots, shoes, hats and clothing generally have advanced 100 to 120 per cent, lime at the rate of 133½ per cent, and ordinary labor just 100 per cent. Coal oil is the only article of common consumption that is cheaper than it was six years ago, and, while every article upon which the cost of gas depends has increased from 100 to over 200 per cent, the price charged for it has advanced from its very lowest rate but about 57 per cent, and it is now, with but a single exception, comparatively the cheapest article of ordinary use enjoyed in the city."

History Will Repeat Itself; Prosperity Coming

The most discouraged and disheartened man in this room is no more so than were the owners of gas properties throughout the country in 1867, as shown by the statements in the foregoing quotation. It is interesting to observe with what precision history has repeated itself by reproducing in the seventh year after 1914 the exact conditions prevailing in the seventh year after 1860. The general financial condition and earnings of the properties at these two dates, fifty-four years apart are substantially the same, while the percentage increase in the price of commodities which go into the gas manufacture, including the cost of labor, are almost the same to-day as they were in 1867.

The achievement and prosperity which was enjoyed by the gas industry in the twenty-five years prior to 1860 sinks into insignificance when compared to that of the following forty-seven years, and if history continues to repeat itself, this great industry of ours will outdo in importance and in public service the achievements of the industry in the period between the Civil War and the Worlds War by as much as that period overmatched the accomplishment of the twenty-five years preceding the Civil War.

"We believe, gentlemen, that there is the opportunity in your Gas Industry itself, and also in the Appliance Industry, to take the public into your confidence and go out and tell your story to get your employees and your dealers behind you in your efforts in order that all of you, working together may go out to that ultimate consumer that is coming. Gentlemen, we may talk as much as we please about manufacturers and wholesalers and retailers. In the last analysis the whim of the consumer makes or unmakes manufacturers and jobbers and retailers. Whoever wins his confidence has won the day, and whoever loses it is lost."

CHARLES COOLIDGE PARLIN
Curtis Publishing Company

The Preparation and Presentation of Rate Cases Before Commissions

WM. G. WOOLFOLK
Chicago, Ill.

STATED in homely language, the preparation and presentation of a rate case before a Commission requires—in addition to a vast amount of hard and laborious work—just two things, namely:

(1) A clean cut and convincing statement of just what the utility has got.
(2) An equally clean cut and convincing statement of just what the utility has got to have.

Simple though this task may appear, it is customary to bring to bear upon it the combined efforts of four classes of technical men. (I purposely leave out the managers and property owners, considering that their only function in the matter is to pay the bills for fees promptly and wait patiently to get the remnants of their property back into their hands for undistributed operation.) These craftsmen—listed alphabetically for obvious reasons—are:

The Accountant
The Economist
The Engineer
The Lawyer

Like all artisans, since the beginning of time, those composing this battery of talent work with the special implements of their particular crafts. Let us marshall these workmen before us—again in alphabetical order—to survey their individual characteristics and qualifications, and also to examine the tools they will propose to use in preparing and presenting a case.

First, the Accountant, bearing his sacred books of record in which, with an artistic regard for the proper color scheme in inks, his debits and his credits are all set forth most precisely and methodically in just the right columns and all balancing so miraculously. Note his actual costs, based upon facts mind you, not theories, and therefore he insists, the only real foundation for value. Observe his surpluses and his reserves for depreciation. Mark how solemnly he bears aloft his classification of accounts, as did Moses of old bear the historic tablets. His craft is the personification of conservatism and dependability. His plant and other capital accounts—to which he refers as investment value—appear substantiality itself. Let us not embarrass him, however, by too closely inspecting his fixed capital accounts and reserves but pass on to the Economist.

In his tool box we find such authors as Adam Smith, John Stuart Mill, Taussig and Irving Fisher, together with ponderous volumes labeled "Value," "Fair Value" "Social Ethics in Rate Making" and the like; surely an imposing array, but as I share with him his difficulty in explaining either his presence here or the usefulness of his tools, we will pass on to the Engineer.

An able workman, the Engineer, and well equipped with tools. Note his inventories of physical property, his elaborate tables of price data, his curves showing the trend of prices over a range of years, his values of the dollar since the time of Noah. Obstacles which would stagger an ordinary man mean nothing to him. With one fell stroke of his *reproduction theory* he can blot out even

so vast a property as that of The Peoples Gas Light and Coke Company, and overnight rebuild it without disturbing service to a single consumer. He can with equal facility fix the reproduction cost of an archaic plant long since abandoned, or the going value of the largest utility in the world. I particularly direct your attention to his tables of depreciation. With these he can tell you to a clock tick just how long your plant will last. This is a wicked tool— you know it of old—and in the hands of the "professional depreciator" its keen edge can be made to lop off large blocks of utility earning capacity before the dismayed property owner can gasp a protest.

Impressed as I am with these craftsmen and the implements which they so proudly bear, my feeling amounts to nothing short of awe when reviewing with what judicial sternness the Lawyer presents his tools for inspection. We have marvelled at them for many years, for prominent among them are nothing less than:

The Smythe vs. Ames Case
The Knoxville Water Case
The Minnesota Rate Cases—
and—
The 14th Amendment.

This craftsman typifies the law of the land. He speaks familiarly of courts and sometimes slightingly of their decisions. He and he alone can interpret for you what that dread oracle, the Supreme Court of the United States, means when it speaks. Regard him with respect—he is an important factor!

Being an Engineer and therefore a man of practical affairs, I can quite agree with the Accountant that the Economist performs no useful function except perhaps to throw a little comedy into the occasion with his "fair conception of what is fair." Indeed, I might go so far as to admit that a common bond of sympathy exists between the Accountant and the Engineers in their secret conviction and privately expressed feeling that even the Lawyer contributes little but contentiousness and confusion to the whole matter.

Naturally, the Engineer having been so closely identified with and responsible for the creation and expansion of these properties, feels especially qualified to express a balanced and expert opinion upon values, to judge the cost of operation, to establish a proper schedule of rates and finally to instruct the Commission just what sort of a decision to make.

The Accountant, dubious from experience with engineering estimates, prefers facts to theories and draws uncomfortable parallels between engineers' estimates and the actual costs. The criticisms of this bloodless and unemotional man of figures are hard for the Engineer to meet, but life itself being just one series of compromises, it would seem natural and easy for the Accountant and the Engineer whose work is so closely allied to harmonize their differences, and though continuing each the use of his own tools, fabricate a structure of values, depreciaton, rates of return and other collateral matters bottomed solidly upon sound business principles and conservative thought, and present it to the Commission for clear and easy adjudication. "Why not?" we say. "We build and operate these properties; we collect and spend the money; we and we alone are responsible for the operations, the finances and the public relations. We know all about these things

and we are the logical people to prepare and present these cases in a simple man-on-the-street manner." Again we ask, "Why not? We know the reason—we know the answer—it is, the Lawyer! He has injected himself into an apparently simple matter and brought complexity in his trail."

Now I think the Lawyer at bottom is a good fellow, or at least he appears to be a good fellow when he deigns to show his human side and I have found it hard to believe that he has been malicious in this, so a year or more ago—in the course of a discussion on "Original Cost" versus "Reproduction Cost"—I made bold to interrogate one of the most distinguished of that guild whom I have ever had the good fortune to meet. I asked him how in the world a lawyer justified his presence on the scene, particularly as it was so often announced that these Commissions are legislative and not judicial bodies.

He was good enough to tell me the Lawyer's own story in a letter which a layman can understand, and I will quote somewhat at length from this letter because of the matters of keen interest which it contains:

"My dear Mr. Woolfolk:

"In our incomplete oral discussion of the legal principles underlying governmental rate making, I stated that primarily the question of "Value" as a basis for rates is a question of law.

"Before coming to the question of "Value" itself, I will sketch a brief history of the juristic thought so that you may be able to see how this came about.

"In England, and indeed in Colonial America, the fixing of rates for public servants, such as wagoners, ferrymen, wharfingers, and the fixing of prices for commodities did not in any sense involve legal questions. If Parliament fixed a rate for a service, or a price for a commodity, the matter was at an end. There was no judicial review. There was no tribunal to ascertain whether the rate or price was fair or reasonable, or whether it permitted a fair return on this or that value. The word of the legislative body was final. No court could afford a remedy because there was not a legal question.

"In this country the regulation of rates by governmental authorities has been a matter of slow and, generally speaking, unreasoned development. At the same time the development of the accompanying legal principles has been faltering, timid, and at times cowardly.

"The reason for the entry of the courts into the general dispute is because the courts have now come to the decision that it is the Fourteenth Amendment which imposes the restraint upon legislative bodies, and that it is the function of the courts to see that the restraint is observed. It must be presumed, therefore, that before the adoption of the Fourteenth Amendment, any state was free to fix the rate of an instrumentality of public service without any check and without concern as to the principles of reasonableness or fairness, so that in the United States, prior to the adoption of the Fourteenth Amendment, it was still not a legal question.

"Indeed, the enactment of the Fourteenth Amendment did not, of itself, bring about a change. At the time of its adoption, no one foresaw, even as a possibility that it would be used as a means to permit the courts to superimpose themselves as correcting tribunals over the people's representatives gathered together in assemblies or legislatures.

"The Fourteenth Amendment prohibits any action by a State which would deprive a person of his property without due process of law. It was adopted, as you perhaps know, to shield freed African slaves from hostile action by Sovereign States. But its language is of such breadth that it has gone far afield from the purposes that caused its adoption. Although its language has remained the same, it has undergone an amazing development, which forms one of the most interesting subjects of American law.

"In the early seventies a movement was started among the Western States looking to-

ward the regulation of railroad rates. This developed into the Granger legislation and litigation; acts were passed regulating the rates for railroads and warehouses, and these regulatory acts were followed by litigation instituted in behalf of the railroad companies. For the companies, it was confidently asserted by their counsel that the States had no power to establish rates for railroads. The claimed immunity was founded upon the theory that the railroads, by virtue of their charters, had been given the right by the States to manage their own affairs and to fix their own rates. On the other hand, the States contended that not only was the power lodged in the sovereign State to fix the rates of the railroad companies, but further that in their regulatory legislation the States were not under any constitutional obligation to observe principles of moderation or fairness. In a word, the States claimed the right to regulate without any limitation whatsoever and in this were sustained by the Courts. That is to say, the Courts at that time would not hold that the Fourteenth Amendment might interfere with the unbridled action of the State Legislatures.

"At this stage, therefore, the railroads were completely defeated. By decisions of the highest Courts the companies had been placed at the complete mercy of State Legislatures. Those bodies, untrained and unwilling to learn had nothing to do but enact regulatory measures without the slightest restraint.

"The legislatures of the Western States soon reflected the lack of restraint which this judicial thought implied. You can readily imagine what a State Legislature would do, even in this day of comparative enlightenment, if it were announced that there could be no judicial interference in any rate which the Legislature might choose to make for any public service company.

"The bitter controversy arising from such legislation soon brought to the public mind the grave fear that there might be an end of many forms of private property. The question became political, and in numerous cases the Courts were repeatedly implored to stand between property interests and the unheeding acts of the Legislatures. Singularly enough, the Courts, although they could not swing back to the contention of the companies (denying all power in the State to regulate rates) did finally come to a method of preventing radical confiscation without leaving the public at the mercy of the public service companies. However, the judicial steps taken to arrive at that point were slow and faltering.

"While the break actually started in 1886, a study of the decisions of the United States Supreme Court in the decade beginning that year shows that it was groping in darkness and confusion in its efforts to lay the cornerstone of a jurisprudence covering the financial relations between public utilities and the communities.

"It is not necessary"—the letter goes on to say—"to detail all the steps taken before the Court came squarely to the conclusion that the Fourteenth Amendment did prohibit the enforcement of a rate that prevented a fair return on property values. I do, however, want to point out that before the Court reached this stage, it struggled in an attempt to use other provisions of the Constitution as checks against the rapacity of the State Legislatures. These other provisions, however, if used, would not have furnished any definite positive rule such as it afforded by the Fourteenth Amendment, which prevents the taking of property.

"These other provisions would have simply meant that the Court would have been obliged to substitute itself as the arbiter of reasonableness, instead of leaving the legislative bodies as the judges. In other words, the other clauses of the Constitution would have been tantamount to the announcement to the Legislatures that the Supreme Court's view of reasonableness stood in the way of radical legislation. That, of course, was most undesirable. The situation demanded that a positive definite clause of the Constitution should be the barrier, and so it was that in 1895, 1896 and 1898 the Supreme Court came finally and positively to the Fourteenth Amendment as a basis for interference with legislative rates. It was then that they announced that the rate must yield a fair return on the present value of the property.

"The importance of this history is at once

recognized if you will only note how prone various state regulatory bodies have been to avoid this definite and positive rule and substitute their own personal ideas of what is reasonable and fair. For example, when they use *"Original Cost"* instead of *"Present Value."*

"If you believe to-day that you have satisfied the legal obligations if you fix a rate that seems reasonable and fair to you, without regard to the question as to whether it yields a fair return on the *present value* of the property, it simply means that you are travelling in medieval stage of thought instead of travelling with the United States Supreme Court.

"And when you express sympathy with the *original cost* basis or the basis of the values in some indeterminate period of years you are simply turning your back on the law and reverting to the time when the determination of rates did not depend upon legal principles.

"I concede," the writer goes on to say," "that the words *present value* are not by any means easy of ascertainment. Furthermore I concede that there is not a definite and positive standard to which the words *fair return* may be referred. But the difficulty of ascertaining those elements is not a reason nor an excuse for injecting a host of uncertainties as you must do if you once attempt the sophistry of proclaiming that the way to determine the *present value* is to ascertain what the value was at some remote time in the past as represented by "Original Cost."

"I admit that the method of arriving at the actual present value is largely an engineering question. The pure reproduction method, with certain reservations has been approved by the United States Supreme Court in various cases. While I think this method is good enough I can concur with Federal Judge Learned Hand that in lieu of or as a check to reproduction it is quite permissible to ascertain the original cost and bring it up to the present values by the application of the proper percentages of increase in labor and commodities."

The letter concludes:

"However while concedely it is an engineering question to determine the actual *present value* and an engineering and accounting question to determine "Original Cost," it is neither an engineering nor an accounting question to determine whether the utility is entitled to the appreciation which has taken place. It is a legal question."

Now gentlemen, while this paper was in no sense designed as an engineering dissertation upon legal principles, I submit it does appear that like death and taxes the lawyer is a fixture and we must allow for him in our councils.

In accepting the inevitable, however, I do protest—and I know that you are in sympathetic accord—I do protest that the lawyer should stick to his law and not try to play all over the piano. During the early stages of the utility business he made our mortgages and contracts and other corporate papers so complicated that no one, not even himself could understand them, and of late years he seems to be doing the same things with our rate cases. Consider the great detail and the extremely high cost of inventories and engineers' estimates. Under present practice no prudent engineer would think for a minute of going on the witness stand without a large mass of supporting detail, costly to prepare and far in excess of what he would prepare if he were actually going to risk his own money in making a bid to erect the plant in question, but which he must have to answer the myriad of questions propounded by lawyers on both sides throughout the long and weary days spent on the witness stand.

Think of the laborious days and nights the Accountant must spend in making up table after table and analysis after analysis of a most excrutiatingly detailed nature to answer and make plain for some lawyer a question which the Accountant thinks perfectly clear on its face and which the Lawyer just won't

understand.

Think of the time and money which could be saved; think how greatly the record could be simplified and how the work of Commissions could be reduced if the Lawyers on both sides would utilize their time and ingenuity and arrange to have the respective engineers and accountants get together outside the courtroom and agree upon the basic facts in each case.

To all this, in justice to the Lawyer, let us have him make pointed answers to the following general effect, much of which you will agree has the earmarks of common horsesense:

"You Engineers and you Accountants are men of highly specialized technical training. Granting you know more about the constructing, the operating and the financing of public utilities than the man-on-the-street will ever learn, you are so immersed in the technicalities of your trade and your conversation is so cluttered up with mysterious technical expressions that when you try to explain the business you are supposed to know so well the ordinary individual doesn't understand what under the sun you are talking about and the Lawyer asks all these questions to make clear your meaning to others as well as himself. Remember, you Engineers cannot expect your bare and unsupported statements to be accepted simply on their face for such does not constitute proof. Your engineering estimates of cost are at best only educated guesses. Show on what known facts these guesses are based and when you make assumptions set forth clearly the mental processes through which you advance in arriving at your conclusions.

"You Accountants, don't you realize that your books do not control or produce values, that the entries recorded therein simply constitute a chart of the institution's financial history? If you do, why don't you make your books understandable? Why for example do you still keep all those accounts with the odd names? "Depreciation Reserves" as one instance. You know that is misleading, that in the majority of cases these reserves don't really exist, that you can only explain them as being merely bookkeeping entries, or in other words, that in nine cases out of ten this "Depreciation Reserve" account is nothing but a little bald-headed man on a high stool before a high desk with a book, a pen and a bottle of ink?

"You round-shouldered engineers with your thick magnifying glasses; you state that nothing should be deducted from your estimated *costs new* "because of depreciation" and in the next breath, backed up by an adroit movement of your mysterious slide rule you insist that real money must be collected from the public to establish Reserve Funds "because of depreciation." Then you blandly seek to allay the resulting confusion by saying that these mean two entirely different things. Why don't you say what you mean?

I am quite sure you will agree that these criticisms which we have had the Lawyer make are not without foundation. Certainly the Engineer and the Accountant are dangerously lax when they make use of terms which may have more than one meaning without clearly defining in non-technical language just what the terms used to mean. For instance, just think how loosely we all of us do use and interchange the words

"Value," "Cost," "Reproduction Cost," "Historical Cost," "Investment," "Original Cost," "Maintenance," "Depreciation." I have frequently sat in meetings of utility representatives where these were used most freely and often I have been astounded to note how far apart the participants in the discussion were in their understanding of the meaning of these terms, each as used by the others.

Examine if you please some of them. For example, "Reproduction Cost:" Simple, yes, but how many define it clearly if they define it at all before they begin to ascertain it? Look at the report of the Valuation Committee of that Dean of American Engineering Organizations, the American Society of Civil Engineers. Here is a report promulgated by skilled and able professional men distinguished in their profession, but it wholly fails to clear up the confusion between "cost" and "value."

Think of the all too familiar 3-column Engineer estimates, the first column labelled "Reproduction Cost New," the second "Per Cent Condition" and the third bearing that relentless title "Present Value." These two latter titles would be absolutely meaningless did they not justify the "Professional Depreciator" in the use of his ax.

Another offender is "Original Cost" the main prop and stay of the "Investment Value" advocates. Even assuming that "Investment Value" is the proper base for present value—which your lawyers will affirm it is not, citing among their authorities Mr. Justice Harlan as persuaded by William Jennings Bryan in the Smythe vs. Ames Case—what is meant by "Original Cost?" My accountant friends, Sangster & Matthews, who have made "Original Cost" investigations of some of the largest utilities in the country, will tell you that "Original Cost" is a myth. Not because figures can't be developed to show what the actual original cost of this or that actually was, but they say because there are as many original costs connected with a property as there are epochs in its history. They point out that these utilities as they now exist are not separate items of property but integral and indivisible complete units, composed of tangible and intangible elements which originally cost somebody some money. Is the "Original Cost" the price paid by the present owners or that paid by some previous owner, and how far back does one go in the case of consolidated properties in identifying the previous owner? At what phase of the process is the halt to be called? When "Original Cost" is taken only of property now existant and the abandoned property left out, does such "Original Cost," they say, not smack most loudly of "Reproduction Less Depreciation?"

Of course it does, and we have a case of when "Original Cost" is not "Original Cost," so instead of clearing the matter up we invent the new term "Historical Cost."

When dealing with "Original Cost," why not clarify the situation by throwing the term "Original Cost" into the discard and boldly designate the findings as "Cost at time of Construction" or "Cost of Ownership"—stating the particular owner referred to. Indeed the Engineer will go farther than this. He will remind the Accountant of the close relations between them as craftsmen on the case; he will tell him how depend-

ent the reproduction cost estimate is for check by the Accountant's actual costs and show him how the gaps in the "Original Cost" have to be filled in with Engineer estimates. The Engineer will then say:

"Here this Lawyer gentleman tells us this "Original Cost" has no bearing on present value. Now we know that to be true. We know that the yard-stick by which "Value" is measured is the dollar. We know that the dollar value changes from year to year. The dollar of to-day is not the dollar of yester-year. Your "Original Cost" is expressed in yester-year dollars, the dollars of an era gone by. Let us get up to date. Between us, let us express these yester-years costs in to-day's dollars and we will have something. And that something will be a check on Engineer "Reproduction Costs" which are in to-day's dollars. Then and not till then can we get on the trail of that much sought for and elusive thing, "Present Value."

But let us bring this "make-believe" three-cornered controversy between the craftsmen to an end. It was designed to bring out certain striking differences still existing between them even at this late date. Vital though it is that these differences be thoroughly aired in order that they ultimately may be composed, I fear that my comments thus far can hardly be regarded as constructive. Indeed, in looking back over my remarks I seem to have followed in the footsteps of the well-known Economist-Engineer, our friend Professor Edward W. Bemis, who at one time when requested to explain his understanding of "Fair Value" testified, "There is no precise definition, I think, or any agreed upon statement to represent it, but there is a very clear conception of what it is not."

Now I think that utilities themselves frequently follow Professor Bemis' example by presenting the negative where the positive is required. By that I mean, that too often an incomplete case full of loop holes is presented rather than a self-contained and well barricaded one, complete in all its parts. This is the main prop and stay of representatives of municipalities. They seize with avidity upon this opportunity to introduce their plausible arguments as to the relation between present value and original cost, as well as their fanciful theories of depreciation.

Therefore, inspired by an earnest desire to make some constructive suggestions in this matter which concern the life or death of the utilities, I hark back to my original statement that the essence of what is required in preparing and presenting a case comprises:

(1) A clean cut and convincing statement of just what the utility has got.

(2) A clean cut and convincing statement of just what the utility has got to have.

To accomplish the first, it is fundamental that the statement of "what the utility has got" should be self-contained and complete, and therefore should embrace:

(a) Explicit written definitions of all the terms used.

(b) A complete inventory of the existing physical property set up in such a manner that it can easily be checked by the Commission of other interested parties.

(c) Estimated tangible and intangible

costs of reproducing the property, plant and business complete from line drips to going value, and adhering absolutely to the definitions laid down.

(d) Cost at time of construction of all the property which the company has ever owned—taken from the books where possible, estimated where necessary—and again adhering strictly to the definition laid down.

(e) A statement expressing the cost at time of construction of property in terms of present day dollars thus correllating it with the reproduction cost of such property.

(f) Estimates of depreciation based upon theories ordinarily advanced by the municipal representatives as well as those advanced by the utility.

(g) Statements of past operating expenses together with estimates of future operating expenses, expressed in understandable detail as to existing and prospective market conditions for labor and operating materials.

(h) A thorough study of the utility's past history as to cost of replacements and renewals—I use these two words in their broadest possible sense—together with an estimate of the future requirments.

(i) An explicit statement of the financial status of the company.

While it is true that the legal side of the case may be based upon the argument that original cost constitutes no part in the determination of present value, and that theoretical depreciation should not be considered, nevertheless the utility should prepare such evidence and be ready to introduce it if necessary for the two-fold purpose of offsetting unreliable evidence introduced by the other side along these lines, and of convincing the governing body that every effort has been made to furnish all the available data which reasonably may be required for a final determination.

It is obvious that what the utility "has got to have" is:

(a) A valuation which gives due recognition to the present value of the property, and

(b) A rate schedule which will produce sufficient revenue to cover:-

A fair return upon such valuation

An allowance for contingencies

The estimated operating expenses

The required amount for renewals and replacements.

As to these items I have only to enjoin with all the earnestness at my command that the rate schedules should not be picked out of the air or borrowed from another city, but should be bottomed solidly upon the exhibits and testimony in the particular case in hand.

There is another phase of handling rate cases which makes for a very clear record and reduces costs materially, and one which is entitled to serious consideration because of its proven effectiveness. I made brief comment upon it in my earlier remarks. I refer to the method adopted in a case decided upon by the Illinois Public Utilities Commission last December. In this case, by mutual agreement of the lawyers of both sides and

with the approval of the Utilities Commission, a conference was formed composed of lawyers, engineers and accountants representing all the interests involved.

This conference was formally organized for the purpose of agreeing upon the basic facts in the case and thus of escaping the usual labored method of presenting testimony thereon. It held daily meetings and made reports of progress to the Commission at stated intervals. In its final order the Commission commented upon this method of procedure as follows:

> "The method adopted by the Commission in this valuation proceeding resulted in the inventory, consisting of 57 volumes, being agreed upon by the committee of engineers and received in evidence in five weeks. The subsequent proceedings, in connection with the appraisal of the property, were completed at the conference in approximately seven months. The work of introducing the evidence to be considered in determining reasonable rates, occupied the time of the Commission not more than 33 days. This represents a saving of time that conservatively can be estimated at two years, if the evidence had been presented in the usual and customary way. The presentation of the case has been thorough and complete."

Based upon my own knowledge of this case I can recommend the adoption of such a method of procedure wherever it is practicable.

Now gentlemen, in concluding; it seems to me in view of the wide differences still existing even at this late date in the meaning of terminology adopted and practices in effect, that it is high time your great and powerful Association seek through its influence to bring about some general uniformity in these matters. The public gives you credit for having already done so and deals with you accordingly.

These cases, no matter in what part of the country they come up, are all composed of the same elements. There is no fundamental difference between the largest utility and the smallest. The differences are of degree, not of principle. It should no longer suffice that each one of these cases be handled as though it were an old-fashioned individual lawsuit, the exigencies of each particular case governing its particular presentation.

Some day one of these cases is going to be presented to the Supreme Court of the United States for final disposition. Now each of us, at one time or another, has inveighed against the unsettled and confused condition of this rate fixing business and have loudly demanded that the court of last resort lay down some definite and fixed rules which will untangle these troublesome questions and have done with this uncertainty once and for all.

Like the political orator, "I view with alarm" the possibilities to the utility business as a whole if that august body bases its decision—as well mayhap—upon an improperly prepared case.

But out upon these dark forebodings let us look towards the brighter side. Let us see this decisive case as one properly prepared and ably presented; with an original record made by craftsmen whose tools were keen of edge and wielded by skillful hands; a case where

the Accountant was clear in explaining his surpluses and his reserves—where the Economist had cast aside all values but present value—where the Engineer had made his estimates impregnable—and where the Lawyer had with limpid clearness expounded his law in briefs which were brief in fact as well as in name.

And to complete this delightful picture of an Utopian rate case, let all utility men, rank and file, fervently and devoutly pray that when they do get this decision it will in all particulars sustain their contentions and, what is equally important, that State Commissioners, all and sundry, will from its language so understand.

Marketing Gas Securities Locally

E. C. SCOBELL
Rochester Gas and Electric Co.

OUR first stock selling campaign was started between the Liberty Loan campaigns some three years ago. A great many of you can remember the unusual demands made on the industry at that time which necessitated an unusual expenditure of money. It was the difficulty of obtaining money from customary sources that prompted our company to attempt what bankers and other financial men said was an impossibility. In that campaign it was necessary to sell as much as possible of the stock authorized in as short time as possible. Intensive and concerted methods were employed. It was the success of that first campaign and the reception it met with by employees and customers alike that prompted the company to continue financing each year a part of its expenditures for extensions by a more or less continuous campaign. It is in connection with this continuous sort of a campaign that I wish to give you the few ideas and thoughts I have gathered together because for many reasons I believe it is this kind of stock selling effort that will bring the best and most lasting results.

To begin with, you are constantly developing a market for your securities where you will get more than the mere use of the money you receive for them. The benefits that accrue from employee and customer ownership are many and will be enlarged upon and presented a little bit later.

A great many of the extensions we must make to keep pace with the demands for our service are made from day to day and it is a great convenience to have money coming in from day to day to meet these expenditures.

Again, it gives a wonderful opportunity to carry on that campaign of educating our customers on the campany's activities which we were told so frankly and emphatically yesterday by Mr. Parlin, of the Curtis Publishing Company were so essential and which he believed was not being done to the extent it could be, and should be.

In discussing stock sales we place the employee first, and it is perfectly proper and logical. The confidence in the company, its ability to pay dividends, the integrity of its management, the safety of principal, all these are essential and must be established in the mind of the purchaser before you can get his name on the dotted line, and you will start with

the employee because every employee is a salesman of, if not for the company, and you must first sell the company to the employee and establish absolute confidence in his mind or he will never be able to create it in the mind of a customer. Therefore give him a square deal, make him as familiar as you can with the company's affairs, make it possible for him to own as much or as little of the company's stock as his thrift will permit for once he has become the owner of shares in the company his entire attitude toward the company and his conception of his duty changes. It is unnecessary to say that confidence must never be abused. Once established, it is invaluable. Once lost, it is impossible to regain. This applies not only to the employee, but to the customer.

I mentioned the fact that every employee is a salesman of, if not for the company. Every employee has some influence somewhere, and at some time is the company in the mind of someone he may come in contact with. As a salesman of the company, he is so imbued with the company's spirit that he defends and upholds it at every opportunity. Encourage him also to be a salesman for the company by paying him a commission on any sales of stock he may be instrumental in bringing about. Place yourself or someone competent to go into the company's financial condition at his services if he has a prospect that wants more information than he can supply. Make it possible for him to buy stock himself by easy payments. It encourages him to thrift, and he just naturally becomes a salesman for the company as well as of the company for his pride of ownership will prompt him to suggest to a brother or a friend the purchase of stock in the company with which he is employed.

So much for the employee. The advantages of customer ownership of stock are so evident and have been discussed so frequently it hardly seems necessary to mention them, and I will discuss briefly the method employed to develop a local market for securities. In connection with the customer ownership I would like to quote from a report gotten out by the public utility securities department of the Society for Electrical Development, and they quote from a paper prepared by Orlando B. Wilcox, Vice President of Bonbright & Company, New York. His remarks on customer ownership are very good, I think, and describe the advantages much better than I could, so I will quote from their paper:

"In selling stock to customers it is the familiar combination of advertising and personal salesmanship that brings success. Advertising will make a certain quantity of sales, but not enough. It will however keep the salesman well supplied with prospects whom he knows in advance are interested and who have invited him to call. In selling stock to the general public the salesman finds that he has to answer a variety of strange questions, as well as to supply solid, substantial information bearing upon the competitive investment value of the security which he is furnishing. Most of us err in overestimating average intelligence. Most advertising is too clever. Plain ideas and plain language get the best returns. Shareholders do not develop into busybodies or nuisances. They do not seek special rates or become careless in the payment of their service bills. Many call

on the manager to give information which he needs as to public sentiment in matters affecting the company. Their interest is welcomed and their advice is eagerly sought. Whenever a share or two is sold to a person of radical inclination he is especially impressed with the value of his suggestions to the company. The radical often has not much in reality to suggest but any shareholder who will volunteer intelligent criticism is regarded as valuable, as genuinely helpful to the organization. Customer ownership is nothing more or less than the mutualization of the utilities. It means popular, but not municipal ownership. It will give the customer of the utility service a measure of proprietorship in the service of the organization and render to him a share of the profits indispensible to any commercial organization which is to perform its functions to society progressively and efficiently. It will make the people financially partners in the service companies and at the same time preserve the responsibility, initiative and economy of private enterprise. It opens the door in a friendly way, to every citizen who is able to produce and save a few dollars and makes him a co-operating friend instead of a suspicious, unjust antagonist."

One of the first steps in inaugurating a campaign was an interview with the local bankers to acquaint them with the Company's aims and its financial condition. Their co-operation was solicited and received and it is absolutely essential. It meant a great deal to be able to refer prospective purchasers to any banker and to know that they could and did endorse and recommend the stock as a perfectly safe iinvestment. The local brokers were also interviewed and their co-operation received to a certain extent, that is, we heard of no instance where they failed to commend the stock if an inquiry was made and in not a few instances they purchased the stock for some customer. Of course the stock was and is advertised constantly in the daily press. That it is worth while we have not the slightest doubt,—stop advertising and sales fall off materially. We are gradually building up a feeling of ownership that is much to be desired by constantly keeping the company and its affairs before the public, emphasizing the fact that we are a local industry that must keep pace with the growth of the city and by investing in a home company they are helping their home city and at the same time they are making a safe investment. We impress on the mind of each individual subscriber that he is making an investment and in no sense of the word a speculation. There is danger that customer ownership of securities would act as a boomerang if the stock ever became a speculative stock that fluctuated materially. You can readily understand that if a customer buys stock above the market price or value and it should decline materially he would have very little good will toward the company. We do not solicit or encourage large subscriptions, preferring a large number of subscribers for smaller amounts.

If stock is purchased on the installment plan and if before payments are completed the purchaser wishes his money back we refund it without question, all owing him interest on his payments at the same rate of return as the stock

earned, the interest being all owed for his money for the time it remained with the company. Once his payments are complete and the stock is issued we cannot buy it back, but do endeavor to find a purchaser of it for him.

This policy we find has done a great deal to create a feeling of confidence in the company and its methods of doing business. We find that the very small purchaser, the man who can only buy a share or two shares is putting usually all the money he has saved up in it, and he is very anxious to know if he can get that money out at any time he wants it if it becomes necessary. We have had several instances where a purchaser has come in before he has completed his payments and asked to have his money back, and he has received it, and then the next day he would come in and reorder the stock and pay all the money back and in one or two cases order more. It was simply his method of finding out if he could get his money back if it was absolutely necessary. We have to take great care that they don't get the impression that once they complete their payments the company will buy the stock back. We can't buy back and resell it. We can, however, and usually do, find a purchaser for him. If we find a prospective purchaser who hopes to buy a home or have other use for his money in the very near future we discourage his buying stock, and advise him to put the money in the savings bank instead. If we find a purchaser intends to withdraw his savings from the savings bank just prior to the time interest is credited, we advise him to wait a few days until the interest is credited. It is a small thing perhaps but creates the impression that we are really interested in him and his affairs, as of course we are.

We absolutely refuse to sell stock to individuals who have charge of trust funds. We advise them in each and every case that a bond is the proper investment for a trust fund. We think that is good policy although we have every confidence in our stock.

We have found a deferred subscription, that is, a subscription to be taken up at some future day, helps to eventually make a sale because while it is not binding and the subscriber is absolutely assured of that fact, still he has it in his mind, and must have a reversal of mind to buy any other stock.

I have said that every employee is a salesman for the company. This can also be said for a goodly proportion of customer holders. They frequently recommend it and bring in their friends. We have had subscriptions from foreign countries on the recommendation of local holders. Every dividend day is a good stock sales day. It is surprising how many use their dividend checks to help buy more stock which is another argument for a continuous sales campaign.

Still another is that the constant calling on customers by stock salesmen unearth a great many complaints or grudges that have not been brought to the attention of the company or have not been properly cleared up. We consider such a man a real live prospect. First, the salesman secures all the facts in connection with his complaint and an especial effort is made to adjust it and clear it up. It always results in a better feeling and very often a sale and a booster, instead of a kicker for the company.

The New Officers

Dana D. Barnum

OUR new President, Dana D. Barnum, was born in Bethel, Connecticut, August 15, 1872. He received his public school education in Bethel and later prepared for college at Wilton Academy, Connecticut. He then entered Stevens Institute and was graduated with the degree of M. E. in 1895. Among his classmates was J. B. Klumpp, of Philadelphia.

Following his graduation, Mr. Barnum joined the E. W. Bliss Company of Brooklyn for a short period and then entered the employ of the Worcester Gas Light Company in November, 1895. He served in various capacities with that company and was elected to the office of President in April, 1915.

In November, 1917, he was engaged by the Boston Consolidated Gas Company as Vice-President in charge of

manufacturing, and in 1920 became its Chief Engineer.

In the 26 years that Mr. Barnum has been identified with the gas industry, he has held important positions with the several gas associations of the country. In 1912-13 he was President of the New England Association of Gas Engineers; in 1916, Chairman of the Technical Committee of the American Gas Institute; and in 1917-18, President of the Guild of Gas Managers. During the last two years he has served as a Director of the American Gas Association.

R. B. Brown, Vice-President-elect, was born in Roselle, New Jersey, in 1872. He received his primary education in his native state and after two years' experience in mechanical work entered Lehigh University, graduating with the class of 1894.

His first position in the gas business was cadet engineer with the East River Gas Company of New York City. From here he went to the Newark Gas Company as works' foreman, serving under Alfred A. Forstall and later succeeded Mr. Forstall as works' superintendent.

His next position was with the American Gas Company as general superintendent of works in charge of construction and operation at their several plants. Later he entered the employ of the Milwaukee Gas Light Company as chief engineer and soon thereafter became general manager and chief engineer in addition to serving as vice-president and director of the West Allis Gas Company and the Wauwatosa Gas Company.

Mr. Brown was an active worker from 1909 to 1916 in the American Gas Institute, filling the offices of chairman of the technical committee, vice-president and director.

He is a charter member of the Wisconsin Gas Association and has served as its president, vice-president and chairman of several committees, one of them being the committee on calorimetry which made the report resulting in placing the State regulation on a B. t. u. basis, Wisconsin being the first state to adopt this standard for gas regulation. At present he is chairman of the public relations committee of the Wisconsin Association.

Mr. Brown is a member of several national engineering societies and a number of Milwaukee clubs and commercial bodies. He has been a director of the American Gas Association since 1919.

Mr. Charles H. Dickey, of New York City, together with Mr. Martin B. Daly, of Cleveland, Ohio, both elected to serve for two years, were the only additions in the list of directors with the exception of the addition of Mr. Charles A. Munroe who will serve for one year.

Central Plant Addressograph

J. W. HEINS
The United Gas Improvement Company, Philadelphia, Pa.

PRIOR to 1917 it was the practice in Philadelphia to prepare gas bills by typewriter, making an original and three copies. This work was done in each of the seven offices under the supervision of the District Agent. In order to keep step with the times, investigation of the various addressographing methods was made by visiting many large companies, particularly public utility corporations in several cities to benefit from their experience of use. The thought naturally presented itself as to the enormous cost of an installation for each of the seven offices. This cost was conceded to be prohibitive, and a central plant finally adopted.

There were in service 194,000 ordinary meters, 76,500 being read and billed monthly and 117,500 read and billed quarterly, for which new plates of necessity had to be prepared. An annual average of 170,000 embossing operations were contemplated in the changing of folio, name and address parts of plates. These operations were to be made wholly, or in part, due to Set, Shut-off and Turn-on Orders, new plates being made only for Sets, as through a system of re-file it is possible to reclaim a good part of plates transferred from active to inactive file through Shut-off orders. When a Turn-on is completed and after having passed through the customary office records, it is sent to the Addressographing Department where the old name piece of the plate is removed and a new piece cut with the consumer's name, and inserted. The same operation takes place through the transfer of ledgers when a new folio is occasioned. This change is made by removing the old folio piece of the plate and a new folio cut and insertion made, all of which is the distinct advantage of the three piece, or so-called Public Utility Plate.

When the contract for the installation of the equipment was placed an agreement was entered into with the manufacturers to emboss plates for the then active accounts. It was soon found, however, they could not work with sufficient rapidity to complete the plates as required, and it became necessary for the Adressographing Department to do the major portion of this work. In fact, when the embossing was completed approximately 60 per cent of the plates had been made by this force.

Previous to the actual installation of the equipment the manufacturers submitted what they considered a fair estimate of the number of employees necessary to operate the plant, to consist of one supervisor and five clerks. The plant was started with one employee less than recommended; the intention being to engage the additional help when runnign at full capacity.

After the installation was completed

and the plant systematized, it became evident that to keep this force employed it would be necessary to take on additional work. This was done by entering into a working agreement to addressograph gas bills for a small subsidiary company with about 4,000 meters, together with pay-roll requirements of approximately 2,500 employees. The work of addressographing meter reader route sheets, which average about 5,000 per month, also is done at this plant.

With the plant operating at maximum capacity efforts were concentrated upon the strictest economy in order to perform the work with a minimum of help. In consequence, the force was gradually reduced to one supervisor and two operators at a monthly cost of $220.00. This figure, with the material and power costs of not over $25.00 per month, represents the entire operating cost. It is unfair to attempt to compare this figure with the former cost of typewriting, due to what might be termed pre-war salaries paid in 1917 and prior thereto.

It was always possible to obtain typists for this class of work at an average salary of $60.00 per month, with approximately eight engaged in the work. Had this practice been continued and no thought given to the installation of an addressographing plant, these salaries would undoubtedly have increased 50 per cent, with no decrease in the number of operators engaged; rather would an increase have resulted. Therefore, it is felt that a very material saving has been effected in cost of operation, allowing 8 per cent for interest on investment and 5 per cent for depreciation, or a total cost of slightly less than $4,600 per year for the operation of the plant, as against a conservative estimate of $7,800 for salaries of eight typists and depreciation to the extent of replacing two typewriter machines annually.

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In the October issue of *House and Garden* appears an interesting article, "Taking the Guess Work Out of Gas Cookery." It, of course, deals with the modern gas range.

ADVERTISING SECTION

A. A. HIGGINS, Chairman — B. J. MULLANEY, Vice-Chairman

CHARLES W. PERSON, Secretary

Address of the Chairman

M. C. ROBBINS

A wider recognition both within and outside the industry has marked the work of the Publicity and Advertising Section during the last year. There is noticeable, in whatever section of the country you care to look for it, a greater interest in public relations work. Gas companies are slowly coming out of the dark and turning the light on themselves. More money is being spent on advertising, both display space in the newspapers and direct-mail. Managers of gas plants are appearing more frequently in public, explaining the fundamentals of their business to local civic bodies and following this up by taking inspection parties through their plants. And officials are paying more attention to the education of their employees.

There cannot help but be an improved public sentiment resulting from this sort of work. It so happens, however, that the industry has been neglecting these things for so long that it cannot expect at this late day to see an immediate and startling turn for the better. Although public relations are improved, they are not what they should or can be. They are good in spots. Here and there you see companies which are bending every effort to get on cordial, sympathetic terms with the public. They are doing a great and useful work for the entire industry. But there are also companies which fail to see the light, and are living in the stone age, apparently, of public relations. They are not only stimulating the evils which beset the gas business, but they are putting a brake on the progress of other companies.

Not until we get away from a "spotty" condition of public relations; not until every gas company in the country is working as a unit to win public support and maintain it, can we be satisfied with the progress of our work. This is no time for congratulation or patting on the back. The results obtained so far by this Section are but preliminary to the bigger ones which can be had only by even more intensive work along lines already established and sufficiently broad in scope to cover the field. We have enough tools to work with. What we need is more companies to use them.

Our advertising service, now in its second year, shows a steady growth. We have 300 gas companies which are more or less constant users of this service, which is now on a weekly and monthly basis. Eventually we shall have to enlarge it to permit the daily insertion of advertisements and the day is not far distant when we will have to add to it a complete merchandise appliance service. The chief effectiveness of this goodwill advertising service from the standpoint of the companies is that it is winning them away from the past bad habit of campaign advertising which has characterized this industry for many years. We are urging the systematic, persistent

use of newspaper display space and are furnishing a service which enables companies to adopt that policy and stick to it.

There are the usual instances, however, of companies absolutely refusing to advertise. This condition has been brought forcefully to our attention recently by the newspaper publishers of the country, several of whom stated that there were gas and electric companies in their communities which were maintaining a "public be damned" attitude so far as advertising was concerned. When such a condition is encountered it is nearly always past bad advertising practice which has discouraged the company from doing business with its newspaper publishers to-day. Censure is not warranted in a case like this. The company first needs to be "sold" on advertising and that is the job of this Section and the newspaper publisher.

We have been urging and will continue to urge that every gas company should have an experienced advertising or newspaper man in full charge of its public relations work. If a man cannot be employed for his full time he should be employed for part time. And once employed he should have the confidence of the men for whom he works and be given a dignified standing in the company's organization.

In the field of direct-mail advertising, the Section has seen the great possibilities attending the frequent use of the companies' mailing lists in placing folders, pamphlets, booklets and other educational and good-will building matter directly in the hands of consumers. The mailing lists of gas companies are the envy of every mail order house in the country and it is gratifying to see that companies are beginning to realize this.

During the year we have issued several hundred thousand folders and pamphlets, touching upon subjects vital to the utility business, and their widespread distribution through gas companies has been one of the outstanding features of our work. As an example of this, our little booklet on the gas meter has enjoyed a distribution of 250,000 copies and has no doubt done a very excellent bit of missionary work in getting the meter understood by the consumer. Companies are also printing good-will messages on their monthly statements and are making more efficient use of the reverse side of the statements. Altogether there is a gratifying appreciation of the possibilities of the mailing list.

As regards the issuance of news articles, the Section has adopted a policy of issuing articles for publication only when they could be justified from a news sense. This is the policy of the other utility associations and we have been working closely together on the matter. It should be stated, however, that the dissemination of news of the gas industry cannot be done efficiently from headquarters through the companies, nor can it be done from headquarters straight to the newspapers of the country without great waste. Either way it is unsatisfactory. National publicity cannot hope to compete with local publicity and here is where the organization of state committees on public utility information proves its worth.

Operating within a state or a certain locality, a committee on public utility information not only knows local conditions, their cause and effect, but it knows the newspaper publishers and the news-

paper business. It is the logical means for disseminating news of the utilities of that state, and no other agency, national or otherwise, has been formed to date which can get the results that the state committees are getting.

There are twelve such committees operating to-day. Preliminary organization work looking toward the establishment of committees in other states is going on steadily, but the movement is not gaining the impetus that it should, based clearly on results already accomplished, the reason being that gas men, among others, have not been sufficiently convinced of its necessity. There should be a committee operating in every state or section of the country and this Section cannot too strongly urge upon the gas industry the need for its cooperation in order that this may be accomplished.

In the field of civic affairs, the gas man has shown a livelier interest than heretofore, but much is to be expected of him in this regard. Appearances before local business organizations have become more frequent and several officials have found that trips of inspection through their plants have done much to enlighten people on the manufacturing problems of the business. Our illustrated lecture on gas has been warmly received and used before meetings of clubs and other organizations with success. There is a need for other lectures but it is doubtful if they ever will be put to any large use until the gas man is more thoroughly convinced of the value of appearing in public and explaining the fundamentals of his business and has conquered his temerity.

Although the Association's motion picture film has been a recent departure from the usual work of the Section, the success already attained with it would seem to justify further activities along this same line. Managers of gas plants have been surprised at the ease with which they could get the film shown in leading motion picture theaters as part of the regular program, and wherever the film has been used it has occasioned favorable comment. This maiden attempt to utilize the advantages of the screen has laid the groundwork for future films and we should like to see this field fully covered in the near future.

Noticeable, also, during the year, has been the demand for information made upon the Section by newspaper and magazine writers, brought about in large degree by the industry's closer relations with the local press of the country and a seeming desire on the part of the public for more information concerning the gas business. We have assisted in the preparation of articles for the *Saturday Evening* Post and other leading magazines and have been responsible, in part, for some of the very favorable editorial expression that has appeared in both newspapers and magazines.

Briefly, our program for the year has called for work along certain well-defined lines in order that a few things might be well done instead of many things attempted and only part of them brought to completion. The Section has definite objectives in mind from the beginning. The more important of these are:

1. To win companies over to a policy of systematic and persistent newspaper advertising by furnishing them with an advertising service broad enough in scope to meet fairly well every local condition.

2. To urge companies to employ a trained advertising or newspaper man and place him in full charge of all advertising and public relations work.
3. To issue folders, pamphlets, and booklets to the companies in order that they may make efficient use of their mailing lists and appreciate the value of direct-by mail advertising.
4. To further the organization and operation of state committees on public utility information.
5. To get company officials to appear before local civic bodies and explain the gas business and its problems.
6. To bring about a closer contact between the gas man and the newspaper publisher, based on business patronage.
7. To convince gas companies that an appropriation for advertising is as necessary as an appropriation for coal or oil.
8. To bring about a more active and sustained interest in publicity and advertising and their effective application in cultivating good-will for the company, all working for an improved public sentiment for the entire industry.

Publicity and Gas

Editorial from the Boise, Idaho, Statesman

THIS is the era of publicity associations. Every industry has its chamber of commerce or its information bureau equipped to flood the newspapers with "write-ups" which, they hope, will stimulate sales. The automobile people, the copper and brass workers, the manufacturers of electrical devices, the executives of railroads, the textile manufacturers, the political organizations, all these besiege the editors of the country with news letters and booklets and offers of free pictures for display. Each weary editor reads the stuff and files it—in his wastebasket.

Not all of this is propaganda. Not all of it is worthless. Much of it consists of very good statistical stuff which a newspaper man is glad to get. A case in point is the letter recently sent out by the American Gas Association's information bureau, which contains the figures of gas sales in this country since 1901. This is how the gas industry has grown:

Year	Consumption cubic feet
1901	101,625,366,000
1905	112,444,237,000
1910	149,430,549,000
1915	204,309,522,000
1916	231,381,313,000
1917	264,493,003,000
1918	271,593,141,000
1919	306,632,786,000
1920	319,887,813,000

These are interesting figures because they prove that the use of gas in American homes is not decreasing, in the face of the largely increasing use of electrical devices. The same letter also shows us that there are 7,000,000 gas

burning appliances in American homes, including water heaters, room heaters and cooking devices.

One is bound to ask, "Does not this enormous use of gas mean a large consumption of coal to produce gas?" And the answer to that is found also:

> To make the gas consumed in households and industry last year required 8,500,000 tons of bituminous coal, 2,000,000 tons of anthracite coal, 1,500,000 tons of coke and 960,000,000 gallons of oil.

All of which means that the user of gas is using coal, coal from which part of the heating elements have been extracted, coal transformed into an economical, clean, continuous and seldom-failing fluid supply.

These facts are worth knowing. And it is to get facts like them for his readers that the busy editor, trying to separate the grain of information from the chaff of propaganda, goes through the stuff of paid press agents. This, as we said before, is the era of publicity associations.

The action taken by the Association in respect to the taxation question is indicated in the following telegram which has been sent to all of the Congressional Conferees on the Revenue Bill.

November 10th, 1921.

Boise Penrose, Chmn.
Finance Committee, U. S. Senate,
Washington, D. C.

Delegates representing Manufactured Gas Industry in all sections of United States and supplying nearly fifty million people with gas service in more than four thousand communities in this country to-day adopted the following resolution:

RESOLVED, that the American Gas Association in convention assembled protests against the great increase in the normal income tax rate applied to Public Utilities. The same reasons which justify the bill of excess profits taxes on unregulated business imperatively demand that no increase burden by way of taxation be layed upon the the Public Utilities of the country. We earnestly urge upon the conferees of the Senate and House of Representatives that the pending Revenue Bill be so modified as to provide that the income tax on Public Utilities shall not be further increased.

American Gas Association,
Oscar H. Fogg,
Secretary-Manager.

What Cooperation Can Do

To be successful, every business must have pleasant relations with the public.

Particularly true is this of your gas company, which is essentially a public service company, existing not for itself alone but to meet a great public need.

Because of this ideal partnership, it is evident that the measure of our service is the amount of good-will we secure from the public.

And the public, in the last analysis, means you.

We need your cooperation. And you need ours.

By working together to correct misunderstandings, to avoid waste of gas and to get full efficiency from the use of appliances, we can make our service a ***good*** service today, a ***better*** service tomorrow and the ***best*** service anywhere a year from now

(Insert the name of your Company here)

MEMBER OF THE AMERICAN GAS ASSOCIATION

Good Will Advertisement No. 20

COMMERCIAL SECTION

A. P. POST, Chairman — WILLIAM GOULD, Vice-Chairman

LOUIS STOTZ, Secretary

Address of the Chairman

H. S. SCHUTT

OUR retiring President recently expressed very forcibly and very clearly the thought that I have in mind when he said "Let us promptly agree among ourselves what the gas industry needs, then, as one man with our shoulder to the wheel, let's get it, IT CAN BE DONE."

I am sure that I am echoing the thoughts uppermost in your mind when I say that the one BIG THING the gas industry needs is STABILITY. We need to stabilize and standardize the higher and profitable rates we have found so hard to obtain. We need to keep these rates if we are to make our securities attractive to the investing public. We need to make our business more secure and certain of fair, just and equitable returns. We need to get a newer and broader view of our situation and of our field of development and learn the vast resourcefulness of our commercial departments.

Publicity, the best friend we ever tied to, must of necessity come to our aid in helping us to accomplish our NEEDS. Upon that point we must all agree since it was publicity walking hand in hand with the selling organization that made the gas industry what it is to-day. During the war period and the period of abnormal costs which continued after the war we all sought to trim and prune expenses at every possible turn. Naturally, the newest addition to our family, the Commercial Department, felt the first stinging blow of economy. As we all know, it became in vogue to dismantle commercial organizations, either to curtail or stop completely advertising and appliance sales and to seek new business only when it was of an immediately profitable character. This policy was, generally speaking, the same in the case of the small company as the large one and was also practically the same in every section of the country. Gas executives everywhere apparently had the same symptoms of "cold feet." No gas company's organization is complete nor can it be successful until the management realizes that a well organized Commercial Department should be a permanent part of his organization.

With the gradual return to normality it is time to agree on a definite commercial policy and a re-enactment of those splendid advertising and selling efforts that were pursued when rates were low and times were easy. What we want to do most of all is TO INSURE the future of the gas industry and there is no BETTER INSURANCE than to keep constantly after new business and develop those *latent* fields we have thus far neglected.

There is a tendency on the part of a great many gas company officials to regard their local territories as no longer affording sufficient opportunities for development to justify commercial effort. Even, if this were true, a gas company could not AFFORD to lie DORMANT in the

matter of publicity. Did it ever occur to you that advertising is not only a SELLING FORCE but it is a RETAINING FORCE. IT BUILDS AND HOLDS THE CONFIDENCE of those IT HAS SOLD. If your gas company had filled every home in your serving community with every known gas appliance and if every consumer were using the maximum amount of gas for cooking, lighting, heating and kindred service, you COULD NOT EVEN THEN AFFORD to drop your publicity efforts. IF YOU DID, you would soon find that your business would begin to fall away. You can keep your customers satisfied with a certain make of gas iron, for instance, only by instilling into their sub-conscious minds a vision of this appliance. Publicity covering this particular appliance—propaganda, if you wish to call it, but whatever name it goes by it is BOUND TO SOAK IN AND KEEP A CUSTOMER SATISFIED that she has the right sort of gas iron. If you fail to appreciate this method, then you may rest assured that the consumer in question is open for a sale of some other make BECAUSE SHE NO LONGER HEARS ABOUT the one she is using. This same argument will apply to the gas industry in general. To keep a customer sold on the use of gas you must let her see FREQUENT ARGUMENTS regarding its use. She must feel that others are BUYING your commodity and then she CONTINUES TO REMAIN SATISFIED.

Many companies have assumed that with sales per capita in the neighborhood of 7,000 or 8,000 cubic feet their consumer is sold up on gas. I want to say right here that any company that is so lax in foresight as to feel that they have completed their work at this point is in a sorry *plight*. Many gas men seem to feel that any business beyond this figure is something they are not entitled to. Because 7,000 or 8,000 cubic feet may have been a company's *goal* ten years ago is no reason why it should continue to be the *goal* to-day or ten years hence. My own opinion, and it is based upon some recent investigations along this line, is that none of us are able to determine what the limit of commercial development may be or, in fact, whether or not it has any limit. When The C. H. Geist Company acquired one of its properties eleven years ago we were advised by the former owners that it was useless to undertake any extensive campaign of development and that money so expended would be wasted because they then felt that they had practically all of the business that was possible to obtain. The sales per capita at that time were 3,683 cubic feet. The sales per meter were 22,600 cubic feet and the revenue per meter $22.31 with gas at $1.00 per 1,000. Now mind you, we were advised to lay off and not to waste our money attempting any further development. Their STATE OF MIND at that time was DISTORTED, THEIR VISION was narrow. They were perhaps not alone in this state of mind which no doubt was the case with many company officials at that time. Had we accepted their advice, WHERE WOULD WE HAVE BEEN TO-DAY? The sales per capita of this company's last fiscal year were 7,470 cubic feet; the sales per meter—38,527 cubic feet, or 16,000 cubic feet per meter that we were told were not THERE. Our revenue per meter was $47.91. Gas rate—$1.30 per 1,000. The average annual merchandise sales during the intervening period were $94,741, and

in one year reached a total of $148,973. Statistics recently published show that during the past ten year period the gas industry as a whole increased its business 123 per cent. Our sales for this company for the same period showed an increase of 157 per cent in the face of advice that the territory had practically reached the saturation point.

Feeling that we were reaching a point where we were becoming more or less satisfied with the showing made by this company, we decided to make an investigation to determine our future commercial possibilities. This covered an inspection of every house in the territory served. As a result thereof we have forced to the conclusion that there is as great an opportunity for development today as when we acquired the property, and I firmly believe that this same situation will be found to exist in nearly every community if a similar analysis is made.

We found, for example, that there were 20,243 gas ranges in use of which only 5,589 were cabinet ranges; that in 13,348 homes coal ranges were still in use and that only 5,232 customers (about 25 per cent of the total number) used water heaters. We also found that there were 2,099 houses without gas service and 1,006 dead services. These figures point out the opportunities for development that are now in sight and they are sufficient to afford plenty of hard and intelligent work on the part of any commercial organization.

This condition soon convinced us that there are lying dormant within our grasp some mighty good opportunities that we were overlooking. We are goig out to get this business and at the same time INSURE a continuation of what we have. We feel that the activities of our commercial organization backed up by a selling campaign of publicity will not only bring us rich reward in increased consumption but it will have a marked and lasting effect upon the goodwill of every present user of gas.

But these figures that I have given you do not tell the whole story by any means. They do not tell us what improvements may be made in the appliance field in the future; what degree of increased effiency may be reached; what new inventions may be put upon the market or what additional fields may be opened up for the domestic and especially the industrial use of gas.

A large part of the responsibility for our future development rests upon the manufacturer. By perfecting appliances, especially along the lines of efficiency and by encouraging inventive genius they can assure the future growth of the gas industry and I am sure that, with the proper encouragement and support from us, they will be able to accomplish much along this line. While the field to-day is fully as fertile as it was ten years ago, it probably requires more careful analysis and specialized effort now than it did then. It is up to the officers as well as the commercial organizations of every gas company to study, and intensify on, their local situations and then to determine upon what lines to proceed. Some may argue that, where a good volume of business has already been obtained, there are no good reasons to expend much time, energy or money on intensive campaigns, that business thus acquired would in the course of time be obtained any way, but this view entirely overlooks the impor-

tance of the time factor and the INSURANCE of a continuance of your present business. The sooner any new business or new class of business is obtained and the longer you can hold on to the business you have, the greater of course is the revenue produced thereby.

During the last four or five years many companies have given much consideration to the profits to be derived from the sale of appliances rather than to the increased sale of gas. I fear that a continuance of this policy and attitude on the part of any gas company will eventually, if it has not already done so, take away from them the position which their company should occupy in the community of controlling the appliance sales.

I am in favor of the local merchants selling gas appliances only when the same can be controlled by the gas company. The local dealers' interest in the appliance ceases as soon as it has been installed and paid for. As a rule, we know quite well that the local dealers care nothing for the efficiency or quality of the appliances they sell as they are interested mostly in selling a cheap article at a long profit. If gas companies continue to let the appliance business get out of their hands, just so surely will they experience trouble and ill will on the part of the appliance user for you know it will always be the fault of the gas and never the fault of the cheap appliance.

I am passing these few suggestions on to you in the hope that in them you will find food for thought and have the successful accomplishment in your own situation following the experience I have related which will in a small way build towards that idea of our retiring President when he said "IT CAN BE DONE."

—o—O—o—

"THE future of the gas business is indissoluably linked with the public good-will. If the nation's citizens are taken into the confidence of the industry and properly informed as to the true facts concerning the manufacture and distribution of gas, they will lend a willing hand in helping sweep away the many seemingly insurmountable difficulties that now confront gas men. Yesterday's policy of handling public relations would bring disaster if pursued by American industries to-day. Now a business can succeed only with the public, never in spite of it."

FLOYD W. PARSONS

Making Your Window Bring Business

TOO MANY MERCHANDISERS have the impression that the first requisite of the window trimmer is an artistic disposition. For gas window displays which will actually sell goods, the faculties of a teacher are much more important.

Every window display, to reach its highest usefulness, should teach the passer-by at least one fact about gas, its appliances and its uses that he did not know before.

A good teacher is able to pick out of all the things he himself knows about a subject, the points which his pupil **does not know**, and he can give the information in a convincing and interesting way.

A good gas window trimmer, if he has the teacher instinct, will pick out the points about a gas range which the housewife had never noticed for herself and emphasize them in one or more trims. In the same way, he will "teach" the fact that there is a new (or hitherto overlooked) gas appliance for burning garbage, for heating irons or for ironing clothes. His point may be the wide variety of special designs for portable lamps.

The educational point may be taught by a demonstration display. The advantages of gas heaters, the arrangement of an All-Gas Kitchen, etc.

A good teacher does not scorn the points of a subject because he himself has heard them so often. A first class trimmer of gas windows will be able to give the public points which may seem old to other gas men but which are new to the passer-by.

He remembers that every window should teach, by its arrangement, the appliances displayed, the demonstration, or the window cards, some lesson. Every window trim should contain some news for the observer. And the window display man who keeps this in mind when he examines his own plans or studies the windows of grocer, jeweler or haberdasher will make marked progress toward better gas windows.

In Memorium

The death of Mr.George W. Eccles, which occurred during the Convention of the Association in Chicago, was a startling blow to those of the membership assembled in Chicago as well as to his friends. Mr. Eccles died suddenly in his room at the Auditorium Hotel and was not missed for several hours because of a statement he had made shortly before his death in which he intimated that he might visit friends for a day or two in the city. Consequently his absence at the Thursday night banquet did not occasion any wonder.

Mr. Eccles was connected with the Davis and Farnum people, serving in a managerial capacity, was an associate member of the New England Gas Engineers and was elected, some years ago, an associate member of the Guild of Gas Managers.

As we are about to go to press, we have received a notice of the death of Mr. Leon H. Scherck, Sales Manager of the Central Hudson Gas & Electric Company, who died at his home in Poughkeepsie, November 16, 1921, in his forty-sixth year.

We have also received notice of the death of Mr. Martin H. Spellman, General Manager of the Westerly Light & Power Company, of Rhode Island, who died November 17, 1921.

Address of Chairman

GEORGE S. BARROWS

THE Manufacturers' Section of the American Gas Association is now completing its third year and it seems proper at this time to review our work, not only for the past year but for the preceding two years, in order to see how nearly we have accomplished the results hoped for and referred to in the annual addresses of the chairmen.

In Mr. Brill's able address he referred to the central organization as follows:

> "The Association has a very competent central organization. It is noteworthy that it is functioning in an efficient manner. It has only made a start; yet it has already shown qualities of leadership so essential to Association development."

The qualities of leadership and the efficient functioning under this leadership anticipated by Mr. Brill have been realized to the fullest extent. Those of us who rely to so great an extent on headquarters for working out the details of the various sectional activities appreciate the ability and interest of the headquarters staff, and it is no exaggeration to say that without this staff not only the sectional activities but the accomplishments of the entire Association would be far below what they are at the present time.

This year your Managing Committee decided that in view of the present business conditions it would be inadvisable to meet except at such times as were needed to attend to matters of pressing importance. Monthly meetings, therefore, were discontinued but the Managing Committee has met thrice, sufficient to handle matters requiring their attention without delay.

The membership of the Section at the beginning of our work in 1919 was 74 manufacturer companies. The membership to-day is 232, approximately 50 per cent of the membership possible.

The gross Association revenue from the present membership is approximately $18,000 annually.

At the four exhibitions held under the auspices of one of our predecessors, the National Commercial Gas Association, the average number of exhibitors was below 80. At our 1919 exhibition in New York we had 106 exhibitors. At the 1920 exhibition in New York we had the same number of exhibitors and at the present exhibition we expect to have approximately the same number of exhibitors.

Both Mr. Brill and Mr. Gribbel referred in their addresses to the desirablity of placing in the hands of headquarters statistics referring to the products manufactured by the various manufacturer company members. In spite of the request made by headquarters, and numerous follow-up letters, it has been impossible to obtain sufficient information from which to draw any definite conclusions. As an indication of the paucity of this information in 1920 practically no data was received. In 1921 thirty-one replies were received to the two hundred

and eleven requests sent out and of these thirty-one replies only a few carried the full information needed for a proper report. While such information might be of definite value to our publicity men and of indefinite value in other ways, we believe that in view of the manifest disinclination of manufacturer company members to furnish these statistics that the matter be dropped until a real need for them is shown definitely. If this need is demonstrated, a large number of manufacturers who have not supplied this information probably would be willing to do so.

The following comparison in membership in 1919-1921 is of interest as evidencing the growth of our Section—

Class	1919	1921	Gain
Appliances			
Ranges	28	45	17
Water heaters	11	37	26
Heating	17	35	18
Lighting	6	8	2
Accessories	35	30	−5*
Baking and annealing	5	0	−5*
Industrial	16	25	9
Appliances used by Gas Companies for manufacturing and distribution			
Apparatus and pipe	24	46	22
Meters	19	25	6
Miscellaneous supplies		22	
Office devices	8	8	

*Loss

Where losses are shown in the foregoing table it does not necessarily mean that we have actually lost members, it is more likely that, due to a change in classification, the manufacturers listed under these particular headings have been changed to other headings.

It is well to bring out the fact that of the seventeen resignations from the Manufacturers' Section a number were companies who were not directly identified with the gas business and who probably joined only to take advantage of the exhibition feature.

The general gain has been most marked and the gain in lighting devices is particularly noticeable in view of the frequent statements concerning the present status of gas lighting.

Mr. Brill suggested in his address to manufacturers that field representatives could be of assistance in persuading gas companies to become company members. During the past year there was a very marked effort on the part of the Manufacturers' Section to carry out this plan. Great interest was shown by the representatives of manufacturer companies and while the results to date have not shown very much actual gain in membership it is our belief that our efforts have been sufficiently encouraging to warrant a continuation of this plan during the coming year.

The gas range specifications have been modified and rearranged as experience has shown desirable for clarity. In but a few cases have any changes been made, the principal changes being a modification of the gauge requirements for sheet metal. It is generally considered by both gas companies and manufacturers that the revised specifications are fully in accord with present day practice, and it is our belief that most manufacturer company members are building their ranges in accordance with these specifications. The same is true of the specifications for gas fixtures—both of these specifications are satisfactory to the joint committee of the Bureau of Standards and American Gas Association which is preparing the National Gas Safety Code.

The grouping of our membership into divisions within the Section referred to by Mr. Gribbel has proved to make for

efficiency in operation and it is recommended that this be continued for the future.

In view of the universality of trade acceptances it seems unnecessary to make any further reference to them.

During the past year the Managing Committee has taken two steps which unfortunately brought about rather disappointing results. One of them was the preparation of the illustrated lecture for use by State or District Gas Associations. The movement was commenced last year with rather bright prospects as the District Associations evidenced an interest in having the slides which we intended to prepare. When we came to work the matter out, however, we found that there was such delay in receiving the photographs from our members that it was impossible to prepare the lecture for the several association meetings, and further developments indicate that it will be better not to attempt such an illustrated lecture. Association Headquarters has now in course of preparation an illustrated lecture which will be of far more interest, not only to District Associations but to the general public, and while the Manufacturers' Section cannot have the credit of presenting this lecture the various members will have an opportunity of co-operating by furnishing material for the lecture upon request of Headquarters.

In accordance with the resolution of the Managing Committee, Association Headquarters was authorized to participate in the standardizing of gas ranges by supplying manufacturers with tags to be attached to ranges manufactured in accordance with the gas range specifications. The tag carried the following wording:

> "Constructed in Strict Compliance with the Standard Specifications of the American Gas Association, Inc."

Only four manufacturers ordered tags, a total of ten thousand tags. It is the feeling of your Managing Committee that it is very desirable that something of this kind be used for the purpose of placing the Association and its activities more in evidence to the general public. It is hoped that the effort to encourage the use of some such means will not be relaxed and that the practice of using them will grow until it is universal.

The Managing Committee has considered several questions of vital importance to the industry as a whole but after discussion it seemed that the time was not ripe to take definite action thereon. One of these suggestions was on "The Merchandising of Gas Appliances" a subject which was brought to our attention by Mr. Post, General Manager, Interstate Appliance Corporation, Philadelphia, Pa.

Recognizing the interest to the industry in this matter the Managing Committee takes pride in being able to present under its auspices a paper by one of the highest authorities on the subject of merchandising in the country, Mr. Parlin of the Curtis Publishing Company, Philadelphia, whose address to you in a General Session must be of the greatest interest because it comes from so high an authority, who is neutral as between gas company and Manufacturer company members, and who can review the subject from a better perspective than we, who are so much closer to the problem.

Another subject discussed by the Managing Committee was the necessity for closer co-operation between gas

companies and manufacturers regarding the conditions of gas supply for which appliances are manufactured. At the present time we find many papers written on the subject of appliance efficiency. To the layman who may see these papers it seems that most gas appliances, particularly domestic appliances are woefully inefficient.. There can be no question as to the sincerity on the part of the authors of these papers, and there can be no doubt but what for certain particular conditions of gas manufacture or distribution, appliances could be manufactured which would be more efficient under those particular conditions. Manufacturers, however, cannot economically, from a commercial standpoint, manufacture appliances to meet particular conditions, they must do as they are doing at the present time, strike a mean which will give the best service to the greatest number. Our difficulty in properly meeting this problem will be helped greatly by more full information from gas company men, particularly the Technical Committee on gas conditions which we must meet in manufacturing appliances. We feel that it is necessary for us to have only such engineering information, and, that except for the gas range specifications, manufacturers should have the freest possible hand in exercising their inventive ability for improving the design of the present appliances and meeting future demands of the public.

From time to time we hear of new appliances being put on the market, usually with a blare of advertising trumpets. While I do not intend to imply any dishonesty on the part of the promoters of these appliances it is, undoubtedly, a fact that many of their statements are colored by a misapprehension of the principles involved in the use of these appliances. It seems entirely proper for the Manufacturers' Section to keep a careful watch for such publicity matter and to call to the attention of the promoters of these appliances any fallacies in their statements. Undoubtedly much harm is done by the impression made on the public mind by statements which cannot be borne out in practice. The handling of these matters may be undertaken by the Managing Committee in co-operation with the Headquarters' staff.

The matter of Group National Publicity has been considered and it has been decided that it is best not to do anything in this matter but to co-operate to the fullest extent with the Advertising Section in such matters as it is proper for the manufacturer members to participate.

The Manufacturers' Section has to record a deep loss to the members personally and to the Section as an entity, in the resignation of Mr. W. W. Barnes, its Secretary since the organization of the Section, and for so many years active in a similar capacity for the National Commercial Gas Association. Mr. Barnes' health has been affected for a number of years but he had striven valiantly to continue his work, and it was only by the emphatic orders of his physician that he has gone on a well deserved holiday. While it is doubtful if Mr. Barnes will return to the East we know that when he again takes up business, even though it may be in a distant part of the country, that we will have his hearty assistance in all Association matters.

The new Secretary of the Section, Mr. Percy H. Hall comes to us well quali-

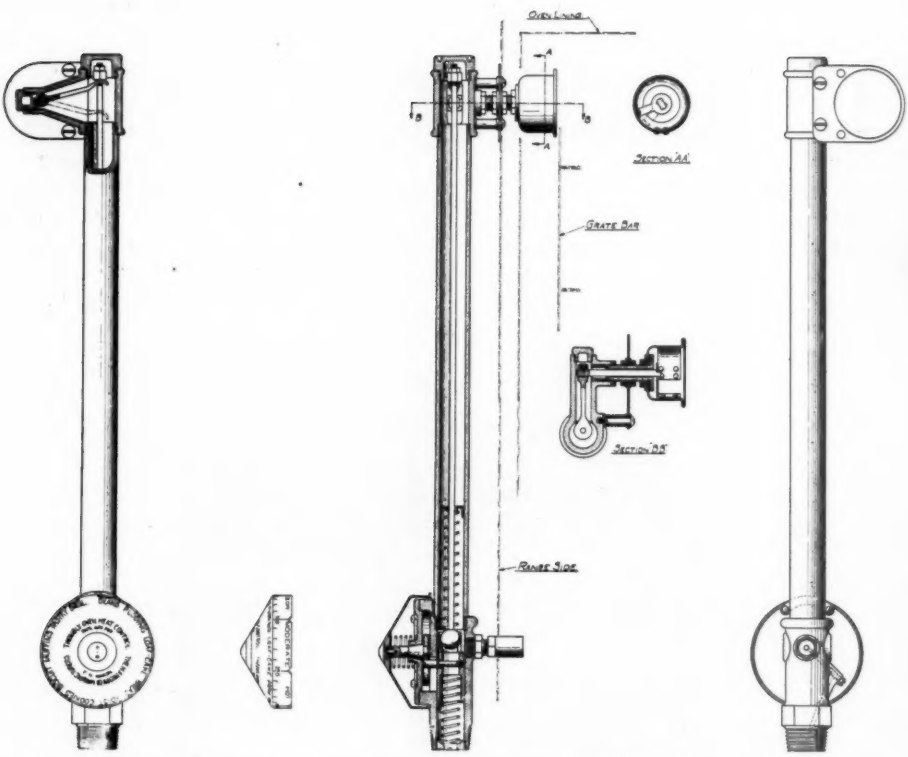
(*Continued on Page 704*)

Thermostatic Gas Oven Control

W. I. TWOMBLY

THERE is perhaps no one subject in which the gas range manufacturer, distributor and buying public are so vitally interested to-day as that of oven temperature regulation.

Up to less than two years ago, the average housewife had never thought of automatically controlling the temperature of her baking oven and had never heard of thermostatic oven controls. To-day, thanks to the broad educational campaign which has been launched, there is in every community a small circle of thinking progressive people, who have learned the value of scientific cooking. Some of them already own controlled ranges and know from actual experience their many advantages. Others are rapidly follow-



ing in line and the circle of enthusiastic owners and boosters is gradually widening. I predict that within the next two years it will be impossible to sell a gas range in any enlightened community without a reliable oven temperature control. The owner of a gas range equipped with a reliable control will never return to the uncontrolled stove with its haphazard, hit or miss results. On the contrary, she is so proud of her new possession that she brags about it to every other woman that she knows and the answer is obvious. Mr. Smith has no peace until Mrs. Smith has a range just as good or better than Mrs. Jones' and Mrs. Smith gets the new range—eventually.

While I am a firm believer in the thermostatically controlled gas oven and optomistic about its future, I can see danger signals ahead. The demand for these controls has developed over night and it has found the average manufacturer wholly unprepared. His experience with and knowledge of heat controlling devices has been very limited and for these reasons, being pressed for a controlled range, he is likely to take the first thermostat offered, provided it looks good and is well presented. In this, there is real danger because if a controlled

range is sold under representation that it will hold the temperature of an oven at any desired point automatically and then fails for any reason to operate as represented the customer is not only dissatisfied, but becomes a chronic knocker and all thermostats are condemned. Therefore, if the range manufacturer wishes to build up a permanent business on a solid foundation, he must furnish his customers with a thermostatic control that is accurate and reliable in performance and that will not change or deteriorate with use.

A thermostat, if it is worthy of the name, must be a very sensitive instrument, responding to the slightest change in temperature and be subjected to no other variable influence. The controlling valve must be placed as close to the gas nozzle as possible so that live gas will be furnished to burner at all times and back firing or popping avoided; otherwise, there is trouble ahead and gas bills

will be higher than they should be.

Thermostatic metals are made from special alloys to withstand high temperatures and should be used in all cases where accurate and permanent results are desired.

The construction of the instrument must be strong enough to withstand the abuse of rough handling in shipping and sensitive enough to respond to the slightest change of temperature in the oven. Its working parts must be protected against both outside injury and the tinkering of boys and others who have more self-confidence than knowledge.

The location of the thermostat is very important and too little thought has been given to this subject. Why should the control be placed on the outside end of range when it is not necessary? Evidently it was placed there years ago for some unknown reason and others have blindly followed because it saved the trouble of original thinking. Manufacturers have for years been building ranges right and left, with smooth ends so that they would fit closely in a corner and economize room. Why, then, should all of this good work be undone by placing the control on the outer end so that the range has to be moved six to eight inches from the wall Demand a control properly placed and you will get it.

The first automobiles were simply the high wheel horse drawn vehicles generally used at that time, fitted with motors and were called "horseless carriages." Experience soon taught that this type of vehicle which was so well adapted to the horse, was not the best design for a motor driven car, and so the automobile as we know it to-day was gradually evolved.

As it was with the automobile, so it will be with the gas range. The application of an automatic control to a baking oven marks as great an advance in scientific cooking as the application of a motor to a carriage did in transportation.

Thermostatic oven controls are new and improvements will be made from time to time. Controls will be designed to better suit the different makes of stoves and stoves will be modified to better adapt them for automatic control. The interests of the manufacturer of gas ranges and the manufacturer of thermostats are one and they should work harmoniously together to produce a gas range that will meet the most exacting requirements of appearance, performance and durability.

In my humble opinion, the automatic oven control marks the beginning of a new era in the gas range industry and when its advantages are generally known, the demand for gas stoves will double in volume and the manufacturer who has vision enough to see this now, and sows his seed early, is sure to reap a rich harvest in the near future.

ONE of the many smaller dinners which occurred during the Convention was that given by Mr. George S. Barrows, the retiring chairman of the Manufacturers Section in honor of the Managing Committee. In addition to the Managing Committee were included the new president, Mr. Barnum, the retiring president, Mr. Munroe, and the new chairman of the Manufacturers' Section, Mr. DeHart.

Address of the Chairman

R. B. HARPER

WE are assembled for the third annual Convention of the American Gas Association to present and discuss, in the various sessions of the Technical Section, those subjects to which particular attention has been directed during the past association year.

Nearly one year ago, those of us to whom you had entrusted the activities of the Section decided that we could best serve the industry and our fellow members by heeding the wise words of our President who had said,

> "Let us promptly agree among ourselves as to what the gas industry needs; then, as one man, with our shoulder to the wheel, let's get it. It can be done."

Through the medium of a letter of inquiry, it was possible to ascertain what some of the members of the Association believed should constitute the activities of the Technical Section. The Managing Committee of the Section then promptly endeavored to classify the suggestions which had been submitted and to agree as to what proposed activities should be carried on in order to meet the technical needs of the gas industry.

We have struggled through a year marked by a business depression and other events which have had their effects upon our industry, but I believe that in general the outlook has been optimistic in character as regards the technical advancement in chemical and engineering matters.

I will not attempt to burden you with a review of specific examples of the technical achievments during the past year, for the committee reports and papers which will be presented at this Convention will undoubtedly better inform you of things accomplished.

Our shoulders have been put to the wheel and it is rolling onward. We have progressed and are progressing. How far we have gone, the records of this Convention will determine. How much farther and by what paths we should advance in the future is for us all to determine.

Shortly after your Chairman assumed office, he decided that a well balanced and well organized Executive Managing Committee would be essential to the sucessful supervision of the varied activities of the Technical Section. The result was the organization of five divisions, namely, the Production, Distribution, Chemical, By-Product and Publication Divisions. These divisions are practically those into which the previous Chairman, in his address, had suggested that the Section's activities naturally group themselves. The next step was the appointment, for each one of the five divisions, of a Chairman who was particularly qualified for the work of respective group.

Your Chairman can testify to the success of such an arrangement and commend its adoption by his successor. The Divisional Chairmen who have constituted the Executive Managing Committee

have made it possible to get a broad viewpoint and consideration on all matters requiring decision, because they had not only broad experience but also specific knowledge in their respective fields of endeavor. They have faithfully attended the various meetings of the Executive Committee which have been held during the past twelve months and have given freely of their time and effort in the promotion of the Technical Section activities of their respective Divisions. Their counsel and coopertion in all matters entitles them to no small measure of appreciation, and I take this opportunity of acknowledging my gratitude to them for their aid in the management of the many activities of the Technical Section during the past year. Particularly do I appreciate their efforts during the formative period in the early part of the association year when the sudden loss of my father and an uncle prevented me from giving proper attention to my Association duties.

It would be a gross injustice for me to neglect to express my sincere thanks and appreciation for the good advice and efficient aid given by the Secretary of the Technical Section, who has so frequently demonstrated his worth and loyalty to the Section and the Association.

Such success as may crown this year's activities of the Technical Section is due to the efforts of the various authors, committee members, those of the Managing Committee who have been associated with your Chairman in directing the affairs of the Sections, and to others who have contributed in any way. To each and all of these, I express my sincere thanks.

"With our shoulders to the wheel," we have not only started along existing paths followed heretofore but we have, in response to the demand of the members of our Association, endeavored to blaze some new trails leading to the goal of common good for the gas industry.

So many paths, new and old, were pointed out by the members, that it was impracticable to follow them all, but insofar as possible, efforts have been made to cover the main roads and by-ways and to start progress along new lines.

The fields covered by the gas industry are so broad and yet so complex and intricate, that no one year of association work becomes other than another mile-stone passed in the long march of progress toward complete knowledge and perfection in our business.

For guidance in determining what future activities to undertake in the Technical Section, we should again turn to our membership. It is for our members to point out the course or paths and for the Section officers and committees to make progress along the prescribed lines.

This brings thought of the very good work done by the various state and district gas associations and the lack of a really effective coordination and mutually beneficial affiliation between them and the American Gas Association, at least, insofar as matters of technical interest are concerned. Your Chairman feels that the subject of more mutually satisfactory and effective technical relations beween these organizatiions and the Technical Section of the American Gas Association is of sufficient importance to demand special study. Therefore, he recommends that a committee be appointed by the Chairman of the Technical Section for the year 1921-1922, for the purpose of making such a study, and of submitting, as soon as possible, some

practical plan of co-operation.

Owing to the broad field to be covered, all of the Technical Section activities, which were either continued or initiated within the last twelve months, could not be completed. Furthermore, all of the committee reports and papers, which have been prepared during the past year, could not be presented within the time allotted for the usual sessions at our Annual Convention. As a consequence, some of the papers and committee reports were selected for presentation in the American Gas Association MONTHLY.

Among those so selected will be found the reports of the Electrolysis, Gas Coal Specifications, and Nomenclature Committees.

The committee reports and papers which will be presented at this Convention are already matters of record on the program of the various sessions, and hence they will not be enumerated. It now remains for you to make the program complete by our contribution of discussions and presentation of facts of interest and value.

Technical progress in the gas industry is no one man's job. It is rather the collective task of all. Upon each of us rests a great responsibility for the proper execution of our part in the future advancement of our industry. There is no single royal road, well paved and easy to travel toward the goal of technical perfection in our business, but there are many old highways to be followed and, I dare say, many new paths, trails and roads to be laid out. Let us firmly resolve to band together and see that our various paths all lead to the ultimate destination. Let us agree to pay a proper toll for the use of such paths by our individual efforts, properly coordinated through Association work, to lay out, perfect and fully utilize all paths or highways of progress for our industry.

Our great industry is not standing still. It is advancing toward better things. In the last decade it has more than doubled its sales of gas. If we think well enough of it to be in it, let each of us do our part in the advancement of the gas industry and put our shoulders to the wheel. None of us should ride to success on the efforts of the fellow members of our gas associations and other coordinated activities, deriving the benefits therefrom, without contributing our proper share.

The efforts of those engaged in effecting economies and improvements in the chemical, engineering and other fields of technical endeavor in the gas industry, should be recognized and appreciated by the public and patrons, but more than this, the financial reward of those contributing to such economies and improvements should be recognized in the matter of rates by regulatory bodies and by the patrons who have received benefits without any effort on their part.

We still need the team work and the experience of those older in the business and in association work, but for the future of our industry, we also need new, red-blooded, young workers who will enter into committee work and gas association activities with an enthusiastic determination and genuine desire to be of service. They who so give service will be repaid fourfold and have the satisfaction which follows a deed well done.

Let every officer or executive of gas companies resolve to encourage and permit technical employees to take active interest in association work by serving on committees, preparing papers or entering into discussion. Let every employee so favored firmly resolve to take such active interest. Then and perhaps only then, will the multitudinous and sometimes diverse individual efforts of companies and employees be co-ordinated into one grand, collective effort which will speed the wheel toward the solution of all of our technical problems. This plea is directed more to the employees than the executives, for the latter as a class know full well the possibilities of association work in educating the individual employee and broadening his mental vision.

In conclusion, fellow members, I ask you to encourage your associates and, if necessary, persuade yourself to enter into gas association activities whenever or wherever the opportunity presents itself. In other words, I simply ask you to be a participant and a worker, not a bystander or a follower-on, in the march of technical progress and to put your shoulder to the wheel with the rest of those who, in the years to come, will carry on the good work required to meet the needs of the gas industry.

"It can be done"

Let us solemnly resolve to do it.

To accomplish the work done annually in the United States, or at least the equivalent any such kind as men could perform, would require the labor of three billion hard working slaves. The use of power gives to each man, woman and child in this country the equivalent of thirty servants. Modern civilization arises from this organized employment of mechanical energy.

GILBERT AND POGUE
In a Smithsonian Institution Bulletin
(As quoted in the *Nation's Business.*)

Determination of Naphthalene in Gas

E. F. COFFMAN, Camden Coke Company, Camden, N. J.

THE writer, not being satisfied with results of duplicate determinations obtained from following methods published on the determination of naphthalene in gas, desired to develop a method which would give results whereby duplicate determinations made on a gas with a naphthalene content of 10 to 20 grains per 100 cu. ft., would check to ¼ grain naphthalene per 100 cu. ft.

Picric acid solutions of different strengths were experimented with in trains containing three to six wash bottles. It was observed a large volume of gas could be washed through a flask containing a very concentrated solution of picric acid before a trace of naphthalene could be observed in the following picric acid flask.

The method was then arranged so the bulk of the naphthalene would be washed out in the first two picric acid flasks, and these flasks were charged with a definite volume of picric acid. In order to insure the removal of all remaining traces of naphthalene, a flask containing a very concentrated solution of picric acid was then placed in the train as the final wash flask.

The results obtained proved quite satisfactory and the method as developed follows:

Reagents:

Picric Acid Solution.
Sodium-alizarine-sulphonate.
N/10 Caustic Soda Solution.
Sulphuric Acid Solution.
Distilled Water.

Apparatus:

1—1/10 cu. ft. Wet Test Meter.
5—250 cc. Volumetric, heavy wall, glass flasks.

Suitable apparatus for titrating the acid and standardizing the caustic soda solution.

Glass tubing, pure gum heavy wall tubing and corks of the proper size to fit the flasks.

Solutions:

Picric Acid Solution:

The stock solution of picric acid shall be of such strength that 100 cc. of the filtered solution will not require over 40 cc. of N/10 caustic soda solution for titration.

N 10 Caustic Soda Solution:

This solution shall be standardized against N/10 standard acid using sodium-alizarine-sulphonate as indicator.

Sodium-alizarine-sulphonate:

To 1000 cc. distilled water add two grams sodium-alizarine-sulphonate agitate and filter. Use two or three drops for titration work.

Sulphuric Acid Solution:

Approximately N/5 solution of sulphuric acid.

Sampling:

The gas shall be taken at a point as close to the main as possible. The sampling line must be free from naphthalene and during the test maintained at a temperature slightly higher than the temperature of the gas passing through the main.

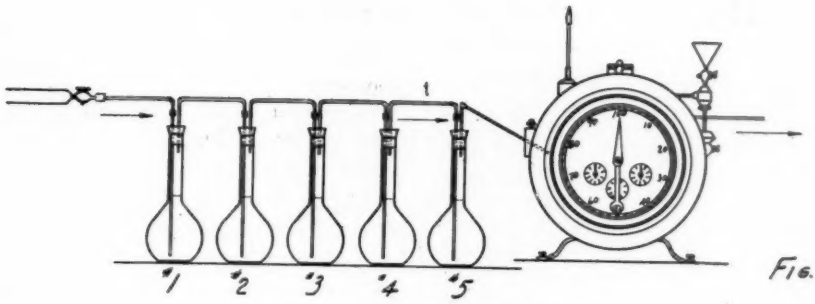


Fig. 1.—Determination of Naphthalene in Gas.

Arrangement of Apparatus and Determination:

The arrangement of the apparatus is shown in figure No. 1. Flask No. 1 contains 200 cc. N/5 sulphuric acid, flask No. 2 empty, flask No. 3 and No. 4 each contain 200 cc. picric acid, flask No. 5 contains 250 cc. picric acid reduced in volume through concentration to about 150 cc.

The picric acid flasks should be filled in the following manner: Flasks 3, 4, 5 which shall be perfectly dry are filled to the mark with stock solution of picric acid; 50 cc. are removed by a pipette from flask No. 3 and 50 cc. from No. 4 and titrated together against the standard caustic soda solution. Call this titre "A."

Place flask No. 5, in a drying oven at a temperature of 105° C. and reduce the volume of the picric acid to about 150 cc., thereby producing a very concentrated solution of picric acid containing a considerable quantity of picric acid crystals. The connections between the bottles and the supply pipe shall be so arranged that there is as little contact of the gas with the rubber connections as possible.

Make sure all connections are tight and pass the gas through the apparatus at a rate not to exceed 2 cu. ft. per hour, discontinue the flow of gas when a considerable quantity of picrate has formed in flask No. 5, note the cu. ft. of gas registered by the meter and correct to standard conditions.

Filter the contents of flasks No. 3 and No. 4 each through dry filters into dry beakers, discarding the first 25 cc. of the filtrate from each.

Remove 50 cc. of the filtrate from No. 3 flask and mix with 50 cc. of the filtrate from No. 4 flask, titrate with the standard caustic soda solution. Call this titre "B-1."

Fill flask No. 5 almost to the mark with distilled water, evacuate all air from the flask with a suction pump, seal the flask by using the stopper and tube as shown in Figure 2, place the flask in a beaker of water and heat with occasional agitation until the solution is perfectly clear. Cool to the original temperature and fill with distilled water to the mark; upon cooling the naphthalene will separate as picrate. Thoroughly agitate, filter through a dry filter into a dry beaker, discard the first 25 cc. of filtrate and titrate 100 cc. with the standard caustic. Call this titre "B-2."

Calculations:

Let A = cc. soda required as titre against 100 cc. original solution of picric acid.

Let 4B-1 plus 2½ B-2 = C
then 6½ A — C = D
and D = cc. soda equivalent of naphthalene in test.

$$\frac{\text{then D} \times 0.1975 \times 100}{\text{corrected cu. ft. gas passed}} = \text{Grains naphthalene per 100 cu. ft. gas tested.}$$

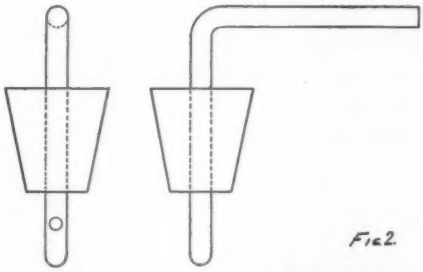


Fig. 2.—Detetermination of Naphthalene in Gas

Precautions:

Care must be exercised to prevent the temperature of the picric acid solution in flasks No. 3 and No. 4 getting so low as to crystallize out some picric acid.

Sodium-alizarine-sulphonate indicator must be added to flask No. 1 to indicate acidity.

Flask No. 5 must be made of heavy glass so that any pressure formed, due to heating in order to dissolve the picrate and picric acid crystals, will not fracture the flask.

Advantages of the Method:

The concentrated solution of picric acid in the 5th flask removes all traces of naphthalene providing precautions are taken to not overload the apparatus.

It is possible to wash a large volume of gas and obtain close checks on the determinations.

Sodium-alizarine-sulphonate, used as indicator, gives a very decided end point and it is possible to obtain close checks on titration work.

The Report of the American Committee on Electrolysis will be available for distribution within a week or ten days.

Associations Affiliated with A. G. A.

Canadian Gas Association

Date of Affiliation—Mar. 25, 1919
Pres.—C. S. Bagg, Montreal Light, Heat & Power Co., Montreal, Que.
Sec.-Tr.—G. W. Allen, Consumers' Gas Co., Toronto
Conv., 1922

Empire State Gas and Electric Association

Date of Affiliation—Nov. 21, 1919
Pres.—E. H. Rosenquest, Bronx Gas & Electric Co., Bronx, N. Y.
Sec.—C. H. B. Chapin, Grand Central Terminal, New York, N. Y.
Conv., 1922.

Illinois Gas Association

Date of Affiliation—Mar. 19, 1919
Pres.—H. H. Clark, 325 Peoples Gas Bldg., Chicago, Ill.
Sec.-Tr.—R. V. Prather, DeWitt-Smith Bldg., Springfield, Ill.
Conv., 1922

Indiana Gas Association

Date of Affiliation—April 24, 1919
Pres.—Morse Dell Plain, No. Indiana Gas & Elec. Co., Hammond, Ind.
Sec.-Tr.—E. J. Burke, Citizens Gas Co., Indianapolis, Ind.
Conv., 1922

Iowa District Gas Association

Date of Affiliation—May 21, 1919
Pres.—C. N. Chubb, United Light & Rwys. Co., Davenport, Ia.
Sec.-Tr.—H. R. Sterrett, Des Moines Gas Co., Des Moines, Ia.
Conv., 1922

Michigan Gas Association

Date of Affiliation—Sept. 18, 1919
Pres.—J. A. Brown, Hodenpyl, Hardy & Co., Jackson, Mich.
Sec.-Tr.—A. G. Schroeder, Grand Rapids Gas Light Co., Grand Rapids, Mich.
Conv., 1922.

Missouri Association of Public Utilities

Date of Affiliation—June 18, 1920
Pres.—H. Spoehrer, Union Elec. Lt. & Pr. Co., St. Louis, Mo.
Sec.-Tr.—F. D. Beardslee, 315 N. 12th St., St. Louis, Mo.
Wiley F. Corl, Chmn. Affiliation Com., Missouri Utilities Co., Mexico, Mo.
Conv., 1922

New England Association of Gas Engineers

Date of Affiliation—Feb. 19, 1919
Pres.— Burton Smart, Portland Gas Lt. Co., Portland, Me.
Sec.-Tr.—J. L. Tudbury, Salem Gas Light Co., Salem, Mass.
Conv., 1922

Gas Sales Association of New England

Date of Affiliation—Oct. 1, 1919
Gov.—H. J. Pettengill, Jr., Blackstone Valley Gas & Electric Co., Pawtucket, R. I.
Sec.—M. Bernard Webber, 150 Congress St., Boston, Mass.
Annual Meeting, 1922

New Jersey Gas Association

Date of Affiliation—April 25, 1919
Pres.—H. H. Newman, Public Service Gas Co., Trenton, N. J.
Sec.-Tr.—H. E. Mason, Consolidated Gas Co. of N. J., Long Branch, N. J.
Conv., 1922

Pacific Coast Gas Association

Date of Affiliation—Sept. 18, 1919
Pres.—Henry Bostwick, Pacific Gas & Electric Co., San Francisco, Cal.
Sec.-Tr.—W. M. Henderson, 812 Howard St., San Francisco, Cal.
Conv.—Santa Barbara, Cal., September, 1922.

Pennsylvania Gas Association

Date of Affiliation—April 10, 1919
Pres.— E. L. Smith, Towanda Gas Co., Towanda, Pa.
Sec.-Tr.—Geo. L. Cullen, Harrisburg Gas Co., Harrisburg, Pa.
Conv., 1922

South Central Gas Association

Date of Affiliation—Oct. 15, 1919
Pres.—Frank L. Weisser, San Antonio Public Service Co., San Antonio, Texas.
Sec.-Tr.—S. J. Ballinger, San Antonio Public Service Co., San Antonio, Tex.
Conv. 1922.

Southern Gas Association

Date of Affiliation—May 20, 1919
Pres.—L. I. Pollitt, Southern Gas & Electric Corpn., Lexington Bldg., Baltimore, Md.
Sec.-Tr.—G. H. Smith, City Gas Co., Norfolk, Va.
Conv., 1922

Wisconsin Gas Association

Date of Affiliation—Mar. 25, 1919
Pres.—J. P. Pulliam, Wisconsin Public Service Co., Milwaukee, Wis.
Sec.-Tr.— Henry Harman, 182 Wisconsin St., Milwaukee, Wis.
Conv., 1922

OTHER ASSOCIATIONS

Natural Gas Association of America

Pres.—L. B. Denning, Pittsburgh, Pa.
Sec.-Tr.—Wm. B. Way, 904-5 Oliver Bldg., Pittsburgh, Pa.
Conv., 1922

Society of Gas Lighting

Pres.—Alex. H. Strecker, Newark, N. J.
V.-Pres.—W. Cullen Morris
Sec.—Geo. G. Ramsdell, 130 E. 15th St., New York, N. Y.
Treas.—Wm. J. Welsh
Conv., Dec. 8, 1921, New York, N. Y.

Southwestern Electrical and Gas Association

Pres.—A. Hardgrave, Dallas, Tex.
Sec.—E. N. Willis, Slaughter Bldg., Dallas, Texas.
Conv., 1922

Recent Articles in Chemical Press of Interest to Gas Men

Contributed by Sub-Committee on Abstracts* of the Chemical Committee

THE SULPHUR COMPOUNDS OF COAL. By A. Mailke, *Journal des Usines a Gaz*, Vol. 45, No. 14, 209. Two mercaptans, methyl mercaptan CH_3SH and ethyl mercaptan C_2H_5SH have been found in the products of coal distillation, boiling respectively at 60 and 36° C.; also methyl sulphide $(CH_3)^2S$ and ethyl sulphide $(C_2H_5)^2S$ of which the boiling points are 36 and 92° C.

Methyl mercaptan exists in coal only in small quantities—of a powerful and disagreeable odor, traces suffice to odorise gases such as blue water gas. It can however, be prepared synthetically by passing wood alcohol over oxide of thorium at 350° C. together with hydrogen sulphide in accordance with the following:

$$CH_3OH + H_2S = H_2O + CH_3SH$$

Similarly ethyl mercaptan may be produced from ethyl alcohol.

These sulphur alcohols possess the curious property of combining with metals, particularly mercury, whence their name.

The sulphides may also be prepared artificially by the catalytic decomposition of mercaptans, by passing over calcium sulphide heated to 300° C. as by the following formula for ethyl mercaptan:

$$2\ C_2H_5\ SH = H_2S + (C_2H_5)^2S$$

Of the sulphur products associated with the aromatic hydrocarbons thiophene is the simplest type. Due to its boiling point (84° C.) it is closely associated with the benzine in the light oils and in the gas. In the former case, thiophene is a catalytic poison for benzine. It can however be removed by numerous methods. Agitation with 2 or 3 per cent of concentrated sulphuric acid sulfonates the thiophene, while the benzine is only slightly affected.

Thiophene can be produced synthetically by passing a mixture of hydrogen sulphide and acetylene over alumina heated to 300° or 400° C. as follows:

$$2\ C_2H_2 + H_2S = C_4H_4S + H_2$$

Certain derivatives of thiophene are of interest; notably the methyl thiophenes $C_4H_3\ (CH_3)S$ and the dimethyl thiophenes $C_4H_2\ (CH_3)^2S$. The former boiling from 110 to 112° are consequently found in the tar.

The dimethyl thiophenes, with boiling points from 135 to 138° follow the xylenes in the rectification of commercial xylol and are likewise removable by sulphuric acid treatment.

Both the methyl and dimethyl thiophenes may be prepared synthetically from thiophene with methyl bromide in the presence of aluminum chloride. All of these bodies may be easily detected by their reactions with phenanthrene-quinone. With thiophene an emerald green coloring matter is produced and violet with the methylated derivatives. The most sensitive reaction however is the blue coloration (indophenin) produced by thiophene with isatin in the presence of sulphuric acid.

Similarly to benzine, naphthaline is accompanied into the tar by the sulphur derivative, thionaphtene. This substance melts at 32° and boils at 221°. To this body is related oxythionaphtene from which is derived a whole series of indigo dyes.

All of these sulphur compounds are not usually found in the tar in sufficient quantity to justify their extraction. One may be surprised at the absence among these bodies of any phenol compounds, which may be due to their lack of stability. (E. L. Hall.)

THE ABSORPTION OF BENZOL VAPORS BY MEANS OF CHARCOAL. *Journal des Usines a Gaz*, Vol. 45, No. 14, 220 (July 20, 1921). The article refers briefly to the work of previous investigators and mentions the discovery that the absorption by charcoal of vapors is much greater when the temperature of the mixture is close to the boiling point of one of the vapors.

The proposed use of charcoal in the United States for extracting gasoline from natural gas is mentioned and it is stated that the process has not been generally adopted and that the absorption of vapors from coal gas does not present the same problem as when dealing with natural gas.

The French Government explosive factories in 1916 investigated the recovery of ether alcohol in the manufacture of cresol by means of sulphuric acid and charcoal.

The writer states that the probability of the naphthaline in the coal gas causing trouble should not be overlooked in useing charcoal as an absorbent.

*Abstractors names appear in brackets following each item.

To choose between the various processes, comparative costs of the apparatus, maintenance, operation and profit should be known. The figures for a charcoal absorption plant at Troisdorf are not yet available. (E. L. Hall.)

THE STORAGE OF COAL IN GAS PLANTS. By M. R. Forrières, *Journal des Usines a Gaz*, Vol. 45, No. 15, 225 (Aug. 5, 1921). The author, after studying spontaneous combustion in coal in storage, has concluded that it is necessary to prevent the escape of hot gases from the surface, and the access of air to the sides, of the heap of coal.

In 1912 a heap of 212 tons of coal was buried and covered with stones and 10 inches of clay. Pipes buried in the heap enabled temperatures to be taken. In 1917 the heap was uncovered and no apparent deterioration in the coal was observed. (E. L. Hall.)

FUEL RESEARCH BOARD'S EXAMINATION OF THE SIMMANCE TOTAL-HEAT RECORDING CALORIMETER. Anon. *Technical Paper No. 1; Gas World* 74, 231 (1921); *Gas Journal*, 153, 739-40 (1921). Continuous tests for 7 months were made. The variations of the recorder seldom exceeded 2 per cent and it responded well to rapid and extreme changes of density and calorific value in the gas. (E. C. Uhlig.)

SULFUR IN COAL AND COKE. By Alfred R. Powell, *Proc. Eng. So., Western Penn.*, 36, 611-40 (1920); cf. C. A. 14, 619, 3145; 15, 306, 742. (E. C. Uhlig.)

ANALYSIS OF IOWA COALS. By George S. Rice, A. C. Fieldner and F. D. Osgood, *Bureau of Mines Technical Paper 269*, 28 (1921). (E. C. Uhlig.)

GIVING AN ODOR TO WATER GAS. *Gas World*, Vol. 74, 1924, p. 440-441. (June 4, 1921.) Complete review of U. S. Bureau of Mines Technical paper 267. (K. C. Walker.)

WHAT INVENTORS ARE DOING FOR THE INDUSTRY. *Gas World*, Vol. 75, 1932, p. 94-96. (July 30, 1921.) Abstracts of patents issued in England. Includes total gasification of coal, manufacture of coal gas, charging and discharging horizontal retorts, vaporizing petroleum into gas mains, and two stage complete gasification. (K. C. Walker.)

INDUSTRIAL GAS-RESEARCH AGENCIES. By R. S. McBridge, *Gas Age-Record*, Vol. 48, No. 5, p. 173-175. (August 20, 1921.) Subject list of laboratories in industrial and government institutions with director and address of the laboratory. (K. C. Walker.)

THERMAL LOSSES IN THE GAS PRODUCER PROCESS. By N. E. Rambush, *Jnl. Society of Chemical Industry*, Vol. 40, No. 12, p. 129t-137t (June 30, 1921.) Study of the principles by means of which it is possible to determine with a reasonable degree of accuracy, the thermal efficiency of the gasification of a given fuel without large scale tests. (K. C. Walker.)

CARBON MONOXIDE POISONING. *Gas Journal*, Vol. 155, No. 3039, p. 319-320. (August 10, 1921.) Review of the (Great Britian) Factory Department of the Home Office's report on CO poisoning. Recommendation for converting CO by cathalytic method into methane. Urges the practice of scenting the CO in gas producer and similar plants. (K. C. Walker.)

ESTIMATION OF BENZOLE IN COKE OVEN GAS AND SCRUBBING OIL. By Lance Shuttleworth, *Gas World*, Vol. 75, No. 1928, p. 73. (July 2, 1921.) Outline of method. (K. C. Walker.)

A FEW TIPS ON THE MANUFACTURE OF CRUDE BENZOLE. *Gas World*, Vol. 75, No. 1928, p. 72-73. (July 2, 1921.) "Tips" are given on suitable solvent oils and suitable scrubber, and distillation. (K. C. Walker.)

OXIDE PURIFICATION. By Geoffrey Weyman, *Gas Journal*, Vol. 155. No. 3038, p. 269. (August 3, 1921.) Review of Chief Alkali Inspector on behavior of Fe_2O_3 in presence of H_2S and O. (K. C. Walker.)

SMALL GASWORKS AND PRACTICAL CALORIMETRY. By N. H. Humphreys, *Gas World*, Vol. 75. No. 1934, p. 126-127. (August 13, 1921.) (K. C. Walker.)

REPORT OF THE LIFE OF GAS-METERS JOINT COMMITTEE. (Institution of Gas Engineers.) *Gas Journal*, Vol. 155, No. 3040, p. 377-381. (August 17, 1921.) This report contains results of study made on (1) chemical and physical causes of corrosion (2) lubrication of meters by spraying and the effect on meters of introducing oil vapor into mains (3) comparison with American Gas Association, (4) work of the Committee in reference to the amendment of the Sales of Gas Act. (K. C. Walker.)

DETECTION OF CARBON MONOXIDE. By C. R. Hoover, *Jnl. Industrial and Engineering Chemistry*, Vol. 13, No. 9, p. 770-772. (Sept., 1921.) Review of the various efforts that have been made for determining small amounts of CO. Focused upon Hoolamite (fuming sulphuric acid mixed with iodine pentoxide and an inert supporting material) and description of two types of apparatus. (K. C. Walker.)

RADIATION THEORY OF THERMAL REACTIONS. By Lewis, W. C. M. and A. McKeown, *Jnl. American Chemical Society*, Vol. 43, No. 6. p. 1288-1306. (June, 1921.) Contribution from Dept. of Physical Chemistry of the University of Liverpool dealing with an expression for the velocity of a unimolecular process, mass-action equilibrium constant, criticism of the radiation hypothesis. (K. C. Walker.)

Debenzolizing Illuminating Gas—Proposed Law. A discussion of a proposed law specifying the quality of gas that may be furnished under contracts, compelling the recovery of by-products. (E. L. Hall).

THE RECOVERY OF BY-PRODUCTS IN THE CARBONIZATION OF COAL. Genie Civil, Vol. LXXIX, No. 1, page 22, July 2, 1921.

The importance of by-products in the carbonization of coal is discussed by M. Berthelot, in "*Chemistry and Industry*," for April and May.

Production of Sulphate of Ammonia is urged.

The French production of 10,000 pounds of benzol per annum does not begin to supply the needs for all carburetors, hence the necessity of increasing the production.

10,000 pounds of sulphur in coke ovens is now going to waste.

The statement is made that direct acid washing for the production of sulphate of ammonia is 25 per cent more expensive than the semi-direct process due to the larger amount of steam necessary for the direct process.

The author discusses the recovery and treatment of benzol and condemns the German procedure while praising the rectifiers of Bregeat and Chenard. (E. L. Hall).

Book Reviews—GAS GENERATORS AND THE ECONOMY OF MATERIALS. By M. Aime Witz, published by J. B. Bailliere and Son, Paris, price 15 francs. (E. L. Hall).

THE CARBONIZATION OF COAL AT LOW TEMPERATURE. By John Roberts. *Gas World*, Vol. 75, No. 1937, p. 17-20 (Sept. 3, 1921). Difficulties of low-temperature carbonization chiefly due to expansion of coal leaving soft cellular mass sticking to retorts. Author has conducted experiments with combination of coke dust of correct size and weight. Gives also studies on heat-transmission in coking, causes of hardness and lustre in coke, production of semi-coke. Discussion follows. (K. C. Walker).

REPORT OF THE COMMITTEE ON INERTS (BRITISH). *Gas World*, Vol. 75, No. 1937, p. 187-189 (Sept. 3, 1921). Recommends that no present limitations be placed on the proportion of incombustibles....that after 3 years when the therm basis of charging consumers has become general.. the inquiry should be again taken up. (K. C. Walker).

CATALYSIS IN THE GAS INDUSTRY. *Gas World*, Vol. 75, p. 190-191, No. 1937 (Sept. 3, 1921). Rideal's lecture in full as it appeared in Journal of the Royal Society of Arts for the 19th of August. Includes incandescent gas mantle, surface combustion, converting blue water gas into methane, removing sulphur by catalysis, and possibilities of hydrogenation. (K. C. Walker).

THE APPLICATION OF SCIENTIFIC METHODS TO INCREASING THE EFFICIENCY OF THE GAS INDUSTRY. By W. N. Booth, *Gas Journal*, Vol. 155, p. 601-606, No. 3044 (Sept. 14, 1921). The full report of the lecture delivered by the author. Covers waste heat, elimination of standby losses, effect of maintenance expenditure on efficiency and cost, retort and boiler settings, cheap oxygen, Jeffries-Norton process, efficiency in use, efficiency of lighting burners, industrial furnaces, and domestic appliances; giving only essential features under each of the above classes. (K. C. Walker).

THE DANGERS OF CARBON MONOXIDE IN LIGHTING GAS. *Gas Journal*, Vol. 155, p. 669, No. 3045 (Sept. 31, 1921). Reprint of the comments on Committee's report found in the British Medical Journal. Medical profession seems to have taken exception to the Committee's report on "moderate" limitations. (K. C. Walker).

AN APPARATUS FOR DETERMINING THE VAPOR TENSION OF BENZOL IN ABSORBING OIL. *Journal des Usines a Gaz*, Vol. 45, No. 17, 262 and 263 (Sept. 5th, 1921). From speech of the President of the Technical Society of the Gas Industry in France at the opening of the 44th convention.

A simple apparatus for the rapid determination of the light oil content of wash oil is completely described. The test can be made on the wash oil before and after the scrubber and places the scrubbing operation under constant control. Previous methods of obtaining the light oil content have been difficult. A graph giving the percentage of benzene contained in wash oil for vapor tensions from 1 to 28 mm. of mercury is also given. (E. L. Hall).

THE PRODUCTION OF HYDROCARBONS IN FRANCE. By M. Paul Mallet. *Journal des Usines a Gaz*, Vol. 45, No. 16, 252 et seq. (Aug. 20th, 1921). A paper read before the Society of Civil Engineers of France.

The author remarks that if Great Britain and the United States had not assisted France in keeping the seas open for the importation of benzol and other hydrocarbons for the manufacture of ex-

plosives and the propulsion of automobiles and aeroplanes, they would have lost the war. They should not allow themselves to be found in this predicament again and should prepare to produce these hydrocarbons from material existing in their own country.

Alcohol has proved a perfect fuel for motors when mixed with 25 to 30 per cent of benzol. In order to have sufficient alcohol available in time of war it must be produced on a commercial scale in times of peace, and this cannot be done without Government aid.

The author states that the present production is probably only 80,000 to 100,000 tons while at least 600,000 tons of light hydrocarbons are used. The maximum benzol production from all sources under the most favorable conditions could not exceed 350,000 tons.

It is essential that means of producing hydrocarbons be found either synthetically or by transforming the heavier oils from coal. Every means should be taken to develop the distillation of coal, and the candle power restrictions in the manufacture of gas modified. This will make the use of water gas, which presents great economic advantages, possible.

In the discussion of the paper it developed that the Automobile Club was much concerned that French internal combustion engines were so dependent on foreign fuel, and that efforts must be made to provide France with its own motor fuel as it might some day be a matter of life or death. It could not be denied that benzol was a necessity and that the candlepower of gas should be regulated to permit of its recovery.

The fact was also brought out that in the United States out of the total artificial gas made, 45 per cent was carburetted water gas and 38 per cent coke oven gas, while in France only 2½ per cent coke oven and 4.2 per cent water gas is consumed. (E. L. Hall).

GAS ENGINES AND BLOWING ENGINES. *Le Genie Civil*, Vol. 79, No. 7, 141 et seq. (Aug. 13th, 1921).

Describes in detail several installations of high power gas engines made recently by the English concern of Galloway's Ltd., one of them is a 1330 H. P. engine running at 87 R. P. M. on blast furnace gas.

The operation of large blast furnace gas engines depends largely on the care with which the gas is cleaned. The gas should be free from tar and water in suspension and the percentage of dust should not exceed .01 gr. per cubic meter. Under full load these large gas engines consume 2520 calories per H. P. hour. (E. L. Hall).

A NEW APPARATUS FOR THE INDUSTRIAL ANALYSIS OF GAS. By M. G. Andoyer. *Le Genie Civil*, Vol. 79, No. 8, 174 (Aug. 20th, 1921).

Describes apparatus which was developed by the author to overcome several faults in the standard Hempel and Orsat instruments and to combine their best features. The new apparatus can be placed in a box and is easily transported. (E. L. Hall).

THE DETERMINATION OF CARBONIC OXIDE IN THE AIR. By Dr. Herman. *Journal des Usines a Gaz*, Vol. 45, No. 16, 250 et seq. (Aug. 20th, 1921).

Describes a process for the accurate determination of the percentage of carbon monoxide by means of Iodic Acid (Reprinted from the bulletin of L'Association des Gaziers Belges, May, 1921).

The editor of the Journal des Usines a Gaz states that there is some fear among the health authorities that the more general adoption of water gas in France on account of its high percentage of carbon monoxide may be detrimental to health. (E. L. Hall).

THE INORGANIC CONSTITUENTS OF COAL WITH SPECIAL REFERENCE TO LANCASHIRE SEAMS. By F. S. Sinnat, A. Grounds and F. Bayley. *Journal of the Society of Chemical Industry*, Vol. 40, No. 1, p. 1-4T. White inorganic partings in coal were analyzed and found to consist largely of calcium, magnesium, and iron carbonates. Considerable of the iron is present in the ferrous state. When the coal is treated with mineral acids more carbon dioxide is evolved than is necessary to combine with the mineral bases in the white partings, which indicates that some carbonates are in the coal itself. The ash from a coal sample has a composition very different from that of the white partings. (R. A. Ragatz).

THE CORROSION OF COKE OVEN WALLS. By A. E. Findley. *Journal of the Society of Chemical Industry*, Vol. 40, No. 2, p. 7-8T. From data obtained at four British coking plants the following conclusions are drawn. (1) The presence of chlorides and iron causes corrosion. (2) Increasing amounts of chlorides increase the rate of corrosion. (3) Iron and moisture alone may be present on relatively large amounts without decreasing the life of the ovens. (4) The higher temperatures employed in the regenerative system reduce the life of the walls. (R. A. Ragatz).

POSSIBLE DEVELOPMENTS IN HYDROGEN MANUFACTURE. By E. K. Rideal, *Journal of the Society of Chemical Industry*, Vol. 40, No. 2, p. 10-14T. The production of hydrogen by the steam iron process is discussed in considerable detail from a theoretical standpoint, Methods for improving the process are suggested.

THE ABSORPTION OF ETHYLENE AND PROPYLENE BY SULPHURIC ACID. By S. G. P. Plant and N. V. Sidgwick. *Journal of the Society of Chemical Industry*, Vol. 40, No. 2, p. 14-18T. The rate of absorption of ethylene by sulphuric acid of different strengths at 50, 70, 100, and 125° C. was determined. Stronger acid and higher temperatures gave the more rapid rates of absorption. Fuming sulphuric acid gave more rapid absorption than 100 per cent sulphuric acid at first, but after several hours this condition was reversed. Propylene is absorbed more rapidly than ethylene. (R. A. Ragatz).

SOLUTIONS OF ACETYLENE IN ACETONE AT HIGH PRESSURES. By Raymond R. Butler. *Journal of the Society of Chemical Industry*, Vol. 40, No. 3, p. 25-26T. Up to ten atmospheres pressure, the volume of acetone when saturated with acetylene increases by 4.4 per cent per atmosphere. (R. A. Ragatz).

THE BRITISH GAS MANTLE INDUSTRY. *Journal of the Society of Chemical Industry*, Vol. 40, No. 3, p. 39-40R. The factors that caused the development of the gas mantle industry, and a statement of its present condition, are outlined. (R. A. Ragatz).

THE SMITH CONTINUOUS SYSTEM OF CARBONIZATION. By George H. Thurston. *Journal of the Society of Chemical Industry*, Vol. 40, No. 5, p. 51-56T. A description of the carbonization plant at Irvington, New Jersey, with drawings of the retorts used. The coal is first subjected to low temperature distillation in a special retort. The product is then ground, briquetted, and subjected to high temperature distillation. (R. A. Ragatz).

ALCOHOL FROM COKE OVEN GAS; THE MANUFACTURE OF.....By C. F. Tidman, *Journal of the Society of Chemical Industry*, Vol. 40, No. 8, p. 86-89T. The process is at present conducted on a semi-manufacturing scale. The coke oven gas, which contains ethylene, is brought into contact with 95 per cent sulphuric acid by passing through 4 towers. When the acid is maintained at 80° C., and the gas is in contact with the acid for three minutes, 90 per cent of the ethylene is absorbed. The absorption product is diluted and distilled under reduced pressure. The distillate contains about 15 per cent alcohol and is concentrated to 87 per cent for use as motor fuel. It has an objectionable odor, and must be refined if used for any other purpose. (R. A. Ragatz).

FRACTIONAL DISTILLATION WITH CONTACT RING STILL HEADS. By R. Lessing. *Journal of the Society of Chemical Industry*, Vol. 40, No. 11, p. 115-119T. A patented contact ring for packing scrubbing towers is described. Tests were made on benzol toluol mixtures when the distilling apparatus was equipped with a still head filled with this type of contact ring. The separating efficiency when using the contact ring still head was found to be greater than when using other types of fractionating apparatus. (R. A. Ragatz).

THERMAL LOSSES IN THE GAS PRODUCER PROCESS. By N. E. Rambush. *Journal of the Society of Chemical Industry*, Vol. 40, No. 12, p. 129-137T. The thermal losses due to the following causes are calculated or estimated. (1) Moisture content of fuel. (2) Effect of condensable volatile matter formed. (3) Effect of fuel grading. (4) Formation of soot. (5) Ash content of coal. (6) Radiation and convection loss. (7) Leakage. (8) Loss in gas cooling and cleaning apparatus. (9) Water vapor in the crude gas from undecomposed steam. (10) Effect of gas outlet temperature and sensible heat loss. (R. A. Ragatz).

QUESTION BOX

THE questions and answers on accounting subjects in the Question Box have been contributed by the Accounting Section Committee on State Representatives, Mr. Ewald Haase, Chairman, who will be glad to receive inquiries from any of our members on their accounting problems.

Questions and answers under "General Problems" are the result of inquiries received at Association headquarters and answered through the committees of the various Sections or from the Association files.

Answers from our members are solicited on questions which come within their experience and such answers should refer to code number of Question, A-1, G-1, etc.

—Editor.

ACCOUNTING PROBLEMS

A-17 We would like to receive information regarding the use of a method of continuous folios for consumers' ledgers that does away with the necessity of changing the folio and line numbers of accounts on the addressograph plates every time a new set of consumers' ledgers are opened. What are the methods used by other companies?

ANSWERS.

Mr. F. R. Barnitz, Consolidated Gas Company of New York, New York, N. Y.

We know of no method which will do away with the necessity of changing the folio and line numbers of accounts on addressograph plates, when the new consumers' ledgers are opened.

However our addressograph system provides for three plates; one small plate for the ledger and folio, one plate for consumer's name and one for the premises. When we transfer ledgers however, it is only necessary to change the ledger and folio plates, and you can readily understand that we are able to use a very large percentage of these ledger and folio plates, as naturally the ledger and folio will correspond with the accounts on the new ledgers.

Mr. Richard Rees, Kalamazoo Loose Leaf Binder Co., Kalamazoo, Michigan.

I presume, judging by the question, (as they mention "Folio and Line") that the ledger used in this particular case is the "Boston" type.

I know of no method that can be applied to the "Boston" ledger that will prevent the changing of "Addressograph" plates when the accounts are transferred from one set of ledgers to another, and also keep the accounts in street number and account number order.

Under a loose leaf system with one account to a sheet the following method can be applied:

Give each street a code number and make an index of the streets showing the code number and ledger that the street is in.

Code No.	STREET	Ledger No.

Put index card in the ledger before each street showing the code number. Use the street number as the account number. If there is more than one consumer at any street number, use a sub number.

For example if the account is at number 150 Main Street and 150 Main Street is in ledger number 1 and the code number applied to Main Street is 5, the "Addressograph" plate would show

1 (Ledger No.)
5 (Street)
150 (Account No.)

If on third floor

1
5
150–3

or basement

1
5
150–B

Of course it would be necessary to give the new ledgers the same number as the old which can be done by marking the years on outside cover

Ledger 1
1921-1922

Under this method the only time the plates would have to be changed would be when, on account of growth or other reasons, the street would have to be transferred from one ledger to another, then only the number of the ledger would have to be changed.

This method would also insure the accounts being kept in street number as well as account number order, regardless of growth.

A. E. Dickson, Consolidated Gas, Electric Light and Power Co., Baltimore, Md.

1. We carry two numbers for each account, first a route number, and second a folio of the account in each route. Our route numbers represent the number of meters read by one man in one day and was determined in May, 1920, when the territory served by this company for both gas and electric was rerouted or redistricted to better equalize the volume of work required of the meter readers per day. These numbers begin at 1 and continue consecutively to approximately 1612 as per billing schedule enclosed herewith. This schedule shows that these numbers are divided into 25 consecutive units, each of which represents approximately 39 active meter reading routes per day. A close analysis of the numbers assigned will however, show an average of 64 numbers per day which is 25 per day in excess of the active meter reading routes. These blank numbers represent anticipated growth in the various sections of the territory served by us, based on reports received from the Engineer and Right of Way Departments who gave us all information available pending future suburban developments. By this method it is possible when three or four books greatly exceed their normal capacity to relieve this peak by using one or two of the consecutive blank numbers adjacent to the books overcrowded, and bill six new books out of four old books, still maintaining our consecutive numerical order of reading. Of course the account number in these four old books must be changed to conform with the order of the six new books, because the former will be disarranged and rebuilt as now.

2. Orders for cutting-in and cutting-out gas or electric service bear the route and folio before they are received in this Department, and are filed primarily in order of completed date and secondarily in route and folio per day.

3. Our addressograph plates carry the route and account numbers and billing address, but do not carry the meter numbers.

4. The route and account numbers on new accounts are originally assigned to the order for gas or electric service by having said order to pass through the Billing Department. This work is executed from key maps of all the territory served by our lines. The route and folio is placed on orders for locations previously served with gas or electric from a card file maintained at the Application Counter, which file makes it possible for the service salesmen to intelligently accept the customers' order, this card stating whether or not a meter is required and other related necessary information.

This Company has never attempted to allot account numbers for each location in the City, because there are a good many housed in the alleys and on small by-streets where the houses are neither piped for gas or wired for electricity. The only anticipating we do is to leave the blank route number referred to above. Of course if a new account is received on one of these by-streets, we have no difficulty in assigning it to the proper route, because our map of Baltimore City will tell us in just what route this street falls. The fact that we have so recently handled this rather large problem prompts me to suggest that a visit to this Company might result in some practical aid in solving your problem.

With a further view of maintaining the numerical order of the folios in each ledger, we left five blank folios between each account, and ten blank folios at the end of each street, which blank folios will be used for new customers whose accounts must be opened in alphabetical street order, and numerical house number order on each street if we are to maintain the original filing system applicable to each ledger.

GENERAL PROBLEMS.

G-46 We are operating in Salisbury a combination high and low pressure gas system, and are furnishing a Finishing Mill from the high pressure side. This Mill consumes approximately three thousand cubic feet per hour at the burners of their singeing machines. This Plant is located three miles from our distributing system, and is fed by a two inch pipe for this distance. This two inch pipe is in turn fed by two two-inch pipes, and this junction is located approximately two and one-half miles from our Manufacturing Plant.

At our Plant the gas is fed into two compression tanks, and held there at a pressure of thirty-five pounds, and is fed out to the mine at a maximum of twenty pounds pressure:—these two tanks have a combined cubical content of 775 cubic feet.

I wish to know the capacity of these two tanks in cubic feet of gas at thirty-five pounds pressure. I also wish to know what pressure I must maintain at the junction of the two two-inch pipes spoken of above to maintain a flow of gas at the Mill in question of 3500 cubic feet an hour under a delivery pressure of one-half pound at their burners.

ANSWERS.

Mr. C. N. Chubb, United Light and Railways Company, Davenport, Iowa.

Where the temperature is constant, the atmospheric volume varies directly as the absolute pressure, therefore the following is true—

$$V_2 = \frac{P_2 V_1}{P_1}$$

The combined capacity of the two tanks according to the above equation would therefore be at 35 pounds pressure.

$P_1 = 14.7$ lbs.
$P_2 = 35$ lbs. $+ 14.7$ lbs.
$V_1 = 775$ cu. ft.
$V_2 = 2620$ cu. ft.

or $= \frac{49.7 \times 775}{14.7} = 2620$ cu. ft. at 30″ barometric and 60° F.

In the above we have assumed water gas at .625 gravity.

For temperatures above or below 60° F. and for different barometric pressures, correction factors for temperature and pressure would have to be applied.

According to Spitzglass sliderule, in order to deliver 3500 cu. ft. of gas per hour under a delivery pressure of ½ pound at burners, it will require 16.8 pounds pressure at junction of the two two-inch lines.

In order to deliver this pressure at the junction of the two two-inch lines it will require an initial pressure at the tanks of 19.3 pounds.

The above figures assume that the pipe lines are clean and that there are no stoppages or reduction in area at any point. As I understand the system, some other service is being rendered, in which event, it might be necessary to carry additional pressure over and above the 20 pounds required at the tanks.

G-47 We have, under consideration, the possibility of storing gas oil in our storage holder. This, we understand, is being done by a number of other gas companies. We would appreciate any information you might furnish us, relative to the covering used to prevent evaporation, the success that other companies are having, and in fact any data which you think would be of value to us.

For your information will say that our storage holder is a two lift, 150,000 cubic feet capacity, the upper lift being approximately 70,000 cu. ft. capacity and the lower lift 80,000 cubic feet. We anticipate storing 160,000 gallons.

ANSWERS.

Mr. F. C. Weber, Henry L. Doherty & Co., New York, N. Y.

I have had no personal experience with the storing of gas oil in the holder. However, a year or so ago when the oil situation was acute a number of our properties raised the point and we always advised against it.

We do not regard the feature of evaporation as being so serious, but it does seem to us that there is bound to be a considerable loss in oil due to the emulsion that is bound to form as the holder rises and lowers. It would be rather difficult to protect the oil against evaporation even if one wanted to. Furthermore, there always is in the holder tank a certain amount of foreign matter which would have a tendency to mix the oil, and thereby spoil at least a part of it.

I have been told that many companies that have experimented with this procedure have found it very unsatisfactory in that the loss, particularly through emulsification and settling, has been costly. I do not believe that I would feel like recommending the proposition.

Mr. H. R. Cook, Jr., Consolidated Gas, Elec. Light & Pr. Co., Baltimore, Md.

Gas oil is frequently stored in gas holders, and I believe sometimes the holder is kept in use while oil is stored therein. However, the general practice is to put the holder out of commission, and this makes the storage of oil in the holder a much safer proposition.

When oil is stored in a holder, and the holder is kept in commission and allowed to cup and uncup, trouble will be experienced with the oil working through the cup and appearing on the outside of the holder. This will not only ruin the paint but will also make a very dangerous fire hazard.

When oil is stored in the holder, same being out of commission, the oil is inserted under the bell of the holder, either by a connection through the crown or by means of a U pipe under the holder sections.

It must be borne in mind that on account of the low specific gravity of gas oil, that the level of the oil inside of the holder will be higher than the water level outside of the holder by approximately 1½ inches for each foot in depth of oil stored in the holder.

ANSWER

G-48 One of our customers (a baker) is using two large ovens and several smaller sizes including doughnut cookers, batch warmers, etc., twenty-four hours a day. We carry between six and seven inches pressure during the day time and cut it down to four inches from eight o'clock in the evening until five in the morning. Four inches of pressure does not seem to be enough for the baker who claims he is not able to get his heats up to where they should be. What would you suggest in order to give him proper service?

Mr. N. T. Sellman, A. G. A. Headquarters, New York, N. Y.

With a minimum pressure of four inches all the appliances can readily be adjusted to operate satisfactorily on said pressure.

We would, therefore, recommend that a service governor be placed on the inlet so that his pressure be four inches night and day and all appliances be so adjusted that ample gas consumption be obtained at this pressure.

All appliances that you have mentioned such as bake ovens, doughnut cookers and batch warmers are operating perfectly satisfactorily on the same calorific gas as you have and at considerably lower pressures.

(*Continued from page 682*)

fied to undertake the duties which will devolve upon him. An experienced manufacturer, a successful commercial man and an executive of proven ability for many years (although in a line foreign to the gas business) he brings to us his ripened experience and the breadth of view which would be impossible for a man who had been associated only with the gas business. With him to drive our ship under the able captaincy of our Secretary-Manager, the duties of our new Chairman as pilot should be pleasant and easy. It is with regret that I relinquish the agreeable obligations of the office which I now turn over to my successor with the heartiest expressions of good will.

Employment Bureau

SERVICES OFFERED

WANTED—Position as executive in a local office of a gas or a combination gas and electric company. Have had practical experience in all branches of commercial utility work. Have been successful in dealing with the public and promoting good will of utility companies. Educated in commercial and accounting methods as compiled by the N. C. G. A. and N. E. L. A. Well acquainted in office routine and very exact on details and execution of same. Address A. G. A.
Key No. 114

GAS APPLIANCE SALESMAN—Especially trained in water and house heating; 15 years' experience; desires selling position, either road or local, with aggressive appliance manufacturer or gas company. Will furnish best selling reference. Drawing account against commission. Address A. G. A.
Key No. 125

WANTED—Position as General Superintendent or Superintendent of Manufacture, coal or water gas; life experience in same, at present superintendent of small plant; A1 references. Salary $200 per month. Address A. G. A.
Key No. 129

Wanted—Position by a man of large general experience in gas business who has made a special study of sales promotion problems, and who would prove valuable as an assistant to a busy executive in any department. Address A. G. A.
Key No. 134

ENGINEER—Producing results in operating desires to make change, either as Engineer or Assistant Engineer of Works with output over 20,000,000 daily output. Or in Managing capacity.—Address A. G. A.
Key No. 135.

AS MANAGER OR SUPERINTENDENT:—39 years old, 15 years experience as Superintendent, 2 years in By-Product Coke Plants. Familiar with Commercial and Accounting work. Present Supervising several small plants. References.
Address Key No. 136.

SERVICES REQUIRED

WANTED—Fitter who can do good work on installation of water heaters, ranges, and who thoroughly understands Gas Company appliance work.
Key No. 1 X.

AMERICAN GAS ASSOCIATION, INC.

HEADQUARTERS 130 EAST 15TH ST., NEW YORK, N. Y.

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